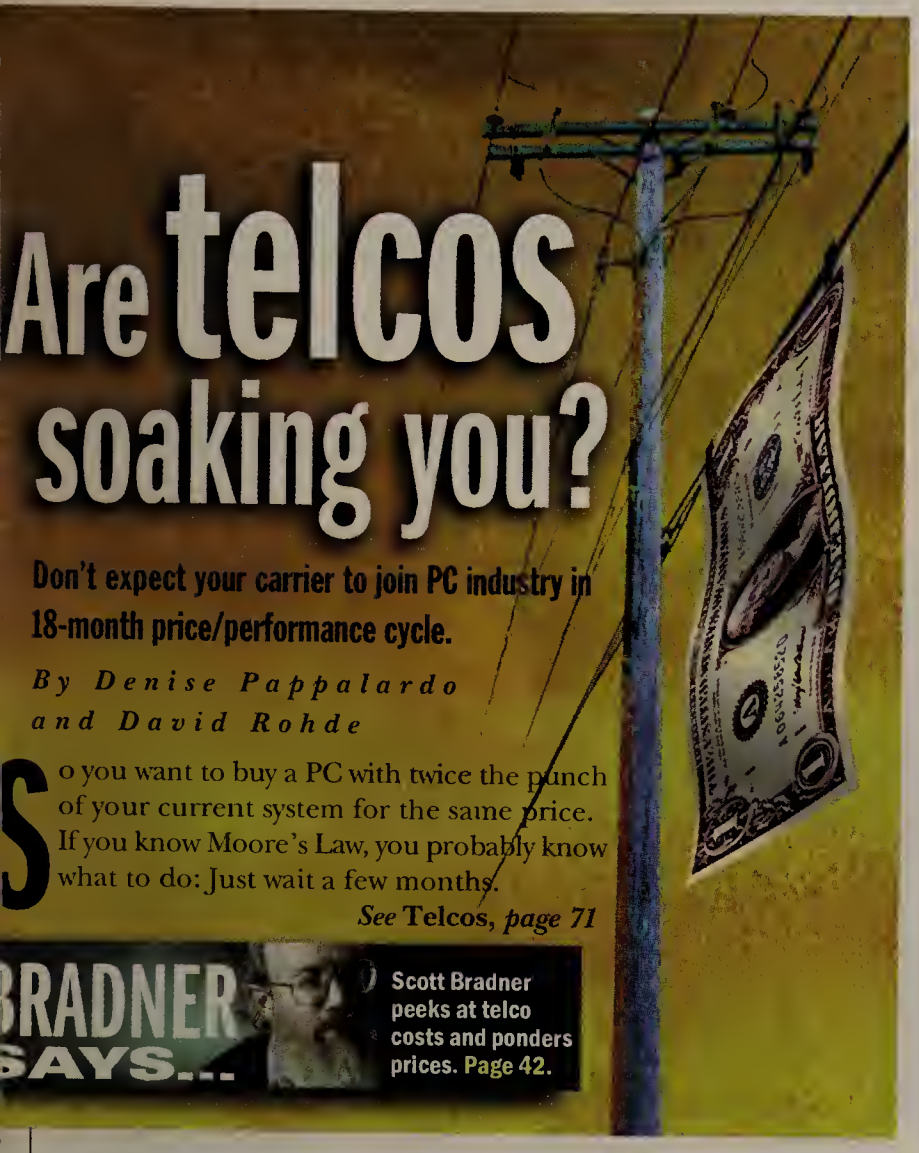
JUNE 9, 1997 VOLUME 14, NUMBER 23

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

Groupware for rent
New services provid
an alternative to
Notes, Exchange.
Page 6.



Are telcos soaking you?

Don't expect your carrier to join PC industry in 18-month price/performance cycle.

By Denise Pappalardo and David Rohde

So you want to buy a PC with twice the punch of your current system for the same price. If you know Moore's Law, you probably know what to do: Just wait a few months.

See **Telcos,** *page 71*

Scott Bradner peeks at telco costs and ponders prices. Page 42.

US WEST changes the rules, derails competitor's DSL plans

By Tim Greene

Think telecom competition is on the upswing? A scrappy little upstart in Iowa City is learning otherwise.

The lesson so far: The big boys still hold all the cards.

Global Analysis Networking Technologies (GIANT), a group of 20-something network engineers, had what it thought was a great idea: lease $25-per-month burglar alarm circuits — copper phone lines that run from GIANT's headquarters to its customers — and put broadband digital subscriber line (DSL) modems on each end.

The result — an inexpensive

See **GIANT,** *page 73*

Bay to bolster big iron link to System 5000

By Jim Duffy

Billerica, Mass.

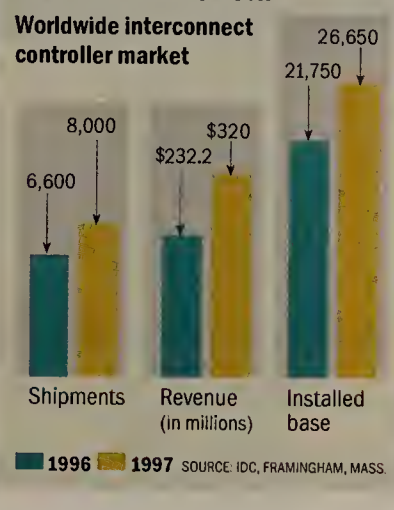
Bay Networks, Inc. later this year will bolster its data center network offerings with channel-attached mainframe gateways.

Sources say Bay is working with Computer Network Technology, Inc. (CNT) of Minneapolis to develop an IBM mainframe channel attachment module for Bay's System 5000 switch. This will let users link LANs to mainframes without going through costly IBM front-end processors (FEP), LAN gateways and SNA controllers.

The System 5000 is a chassis-based switch that holds switched and shared-media LAN, WAN

See **Bay,** *page 72*

A NEW TARGET FOR BAY



Bay to buy Rapid City

Planned deal will give Bay entree into hot Gigabit market.

By Jodi Cohen

Acquisition-hungry Bay Networks, Inc. appears ready to grab one of the Gigabit Ethernet industry's hottest prospects: Rapid City Communications.

Bay is in negotiations with start-up Rapid City, but the companies are still wrangling over details of a deal that could be worth about $150 million, sources said.

Neither firm would comment on the talks, but Bay's CEO David House said the company has a number of deals in the works.

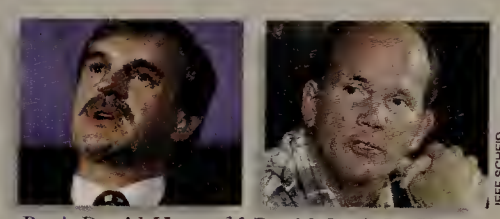
"We have done four acquisitions since I've been here because our development efforts were not in the shape I would have liked," said House, who joined the company last November. "We will continue that [acquisition pace]."

A deal with Rapid City would give Bay a family of Gigabit Ethernet devices that can switch and route on any port at wire speed, which would play nicely into Bay's new Adaptive Networking strategy, industry observers said.

In addition, the acquisition would better position Bay against top competitors, including Cisco Systems, Inc., which acquired Gigabit Ethernet upstart Granite Systems, Inc. last September for $220 million, and 3Com Corp., which has already announced a family of Gigabit Ethernet gear.

See **Rapid City,** *page 72*

A GOOD MATCH?



JEFF SCHEID

Bay's David House & Rapid City's Joe Kennedy

Get more info online, including Gigabit Ethernet overviews and reports from our dinners with Gigabit Ethernet pioneers.

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www.nwfusion.com

New push paradigm blasts data within enterprise

By Carol Sliwa

Start-up Vitria Technology, Inc. today will launch a Web-enabled push product designed to simplify the job of distributing information in real time to users and applications across corporate intranets and the Internet.

Unlike the push technology commonly talked about these days, in which consumer-oriented text information is delivered at scheduled intervals, Vitria's Velociti channel server makes it possible to transmit structured business data — typically from one application to another — the instant it is published.

"This is a new, cost-effective way of getting independently developed application subsystems to talk to each other," said Roy Schulte, a vice president in the system software architecture division of the Stamford, Conn.-based Gartner Group, Inc.

Building real-time links between resources is normally an arduous task, Schulte said. "Both sides have to be tailored to the other. With this approach, the applications don't have to know as much about each other. So it's much more practical to

See **Vitria,** *page 73*

PROFILE: VITRIA TECHNOLOGY

Based: Mountain View, Calif.

Founded: 1994

Cofounders: **JoMei Chang,** president and CEO

Dale Skeen, chief technology officer

Robert Halperin, board member

Products: Third-generation publish/subscribe applications

Access Network World Fusion using the number in yellow. See page 5 for details.

Microsoft® BackOffice™ handles a terabyte of data

a hundred million Web site hits a day

1.8 million e-mails in 24 hours,

each on a single server.

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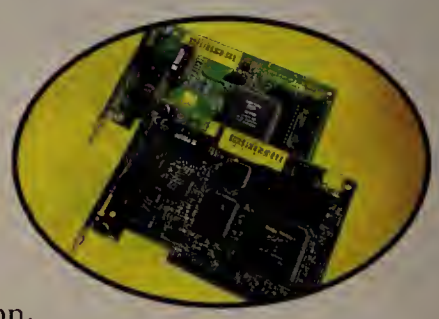
While 3Com's Fast EtherLink® XL and EtherLink XL network interface cards accelerate desktops, their DynamicAccess™ features can actually increase the performance of entire networks.

NICs get Strategic



Can any network interface card jumpstart your network and make your job easier? 3Com's can. EtherLink XL 10 and Fast EtherLink XL 10/100 Mbps PCI network interface cards (NICs) deliver the maximum throughput and the lowest CPU utilization, thanks to 3Com's patented Parallel Tasking® technology. But add 3Com's DynamicAccess features and these high-performance cards actively work with the rest of your switched network to improve overall performance and manageability, while giving you greater control over bandwidth and resources.

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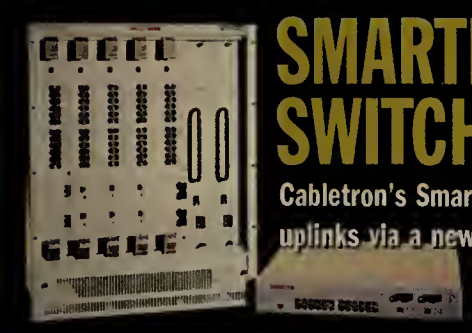

SMARTER SWITCHES AHEAD

Cabletron's SmartSwitches gain WAN uplinks via a new module. Page 19.

SILVERSTREAM SHINES

A start-up led by Powersoft's former president boasts a complete Java-based Web application development kit. Page 39.

LOCAL MARKET LOCKOUT?

RBOCs need to get better at switching new customers to local carriers, says LCI's Anne Bingaman. Page 35.

NetworkWorldContents

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SPECIAL FOCUS

Windows NT

Multiuser OSes are on the rise. Page 24.

FEATURES

BUYER'S GUIDE — HIGH-END HUBS POWER UP

SONET IS IN THE AIR

Philadelphia utility zips LAN traffic over radio-based SONET. Page 61.

FIND IT @ FUSION

To quickly get to any online info referenced in *Network World*, type its DocFinder number in the input box on the home page.

This Week

Only on Fusion

Plans to expand the number of Internet domain registries are behind schedule but have survived one court challenge and could still go into effect by year-end — as long as the government doesn't step in. **DocFinder: 2328**

A specification introduced last week for business-to-business transactions over the Internet received only lukewarm reviews from industry watchers, who said the spec should go further and needs more backing. **DocFinder: 2329**

From the front page

Read our Page 1 story on telecom costs, then come online for a library of articles on the issue. **DocFinder: 2325**

And when you're done with our article on phone companies and would-be DSL competitors, link to Fusion for an audio primer that explains how DSL works. **DocFinder: 2326**

Letters

Readers take us to task for criticizing Java. See what they have to say. **DocFinder: 2312**

Features

Find the high-end hub of your dreams with our interactive buyer's guide. Check off the criteria most important to you, then see which hubs match them — and get complete specs as well. **DocFinder: 2311**

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How to contact us

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News briefs, June 9, 1997

Does Bobby play fair with others?

Bay Networks, Inc. has filed a lawsuit against Gigabit Ethernet start-up Foundry Networks, Inc. for allegedly hiring away Bay employees.

Foundry President *Johnson*

Because Foundry President and CEO Bobby Johnson formerly headed up token-ring and ATM switch vendor Centillion Networks, Inc., which was acquired in May 1995 by Bay, rumors swirled that the lawsuit surrounded stolen Centillion technology.

But Johnson told *Network World* last week that the lawsuit was about the large number of disgruntled Bay employees that Foundry has hired.

Johnson pointed out that every Bay hire has been documented and said, "We find the lawsuit factually inaccurate and frivolous." Bay would not comment on the legal matter, although CEO David House said, "We will always defend our intellectual property and make sure that people play fair."

Java takes a lump

Sun Microsystems, Inc.'s attempt to get its Java programming language approved as an international standard hit a roadblock last week as U.S. representatives to the International Standards Organization voted "No" on the proposal.

The vote was not a clear-cut rejection, but rather a "no vote with comments," which leaves room for Sun to address the U.S. group's concerns. Sun executives said the concerns have to do with limited use of the Java trademark, error fixing, how the specification would be maintained and which technologies Sun is turning over for standardization.

Long-distance industry gets new No. 5

Two little-known but rapidly growing carriers announced a merger on Friday that would make the combined entity the fifth-largest U.S. long-distance carrier. Dallas-based Excel Communications, Inc. will buy Telco Communications Group, Inc. of Chantilly, Va., to form a new $2 billion company.

Excel is a switchless reseller of long-distance service to residential and small business customers, using capacity bought from larger carriers and a network of independent marketing representatives.

By contrast, Telco owns switches and markets directly to customers with a five-digit dial-around plan. Analysts regard Telco as one of the companies that has recently made life miserable for AT&T by taking away consumer market share.

A little off the top

Novell, Inc.'s workforce reduction is starting close to the top. The company last week announced President Joseph Marengi will leave the company.

Marengi

The departure of Marengi, who assumed the presidency last September following the resignation of CEO Bob Frankenberg, comes in the wake of two consecutive dissappointing quarters.

CEO Eric Schmidt, who got the top job over Marengi, announced May 28 his plans to lay off 1,000 employees in an attempt to get Novell back on track.

Buyer's Guide date change

Network World's 100M bit/sec and Gigabit Ethernet switch Buyer's Guide will run in the Aug. 11 issue, and the LAN-based ATM switch Buyer's Guide is now scheduled for the Oct. 6 issue.

To request a survey for either of these, send e-mail to Kathy Scott at kscott@nww.com and include a contact's name, phone number and e-mail address.

Groupware: Why buy when you can rent?

By Paul McNamara

You do not have to buy, install and administer costly groupware applications to put collaboration tools in the hands of end users: You can rent them, saving yourself money and time.

That is the pitch a growing number of software vendors are delivering to customers who think that groupware from standard-bearers such as Lotus Development Corp. and Microsoft Corp. is out of their league.

So far, Lotus and Microsoft have not needed to worry about losing the franchise to these Web-based landlords. However, there are those who believe that application rentals — also called subscriptions — have a bright future, particularly for time-sensitive or short-term projects, as well as for smaller companies in need of far-flung extranets.

"I wouldn't be surprised if this trickle turns into a storm in 1998," said Paula Boyle, an analyst at Kinetic Information, Inc., a Waltham, Mass., consultancy.

Clouds appear to be building:

- Changepoint International Corp. of Toronto last week announced that its Involv Intranet service, built on Lotus' Domino server technology, will be open for business by month's end.

After a free three-month trial, customers will pay $25,000 per year for Involv, which includes a customizable corporate Web site, three standard groupware applications and a template for creating additional specialized applications. Customers using Web browsers access the applications by linking to a server hosted by an Internet service provider or the company's own IT department.

- IntraACTIVE, Inc., of Washington, D.C., next week will unveil a version of its InTandem group collaboration software that can be rented from the company or an ISP starting at $29 per user per month. IntraACTIVE believes small to midsize businesses slimming down their IT departments and deploying thin clients will be attracted to offerings such as InTandem.

- Groupserve, a Bethesda, Md., start-up, this summer intends to be up and renting not only groupware, but also applications such as videoconferencing and whiteboards on its E-meet site (www.e-meet.com).

- In addition to enabling its business partners to build subscription applications on Domino, Lotus has a product in beta tests called Instant TeamRoom. This rentable collaboration software will be available soon, a company official said.

Renting will not be for everyone, of course. Right now there are only a few vendors pushing untested services of limited functionality at a marketplace wary of Internet security and scarce bandwidth.

Nevertheless, today's early renters are enthusiastic.

Carter Crawford, a partner at Solutions for Information & Management Service, a New York-based management consulting firm, has used Changepoint's Internet rental service to coordinate collaboration between her clients and their business partners. Crawford said her work is too fast-paced to wait for multiple participants to establish working links through normal IT channels.

"The infrastructure takes so long that the project's half over by the time you've got it done," Crawford said.

While her firm is small, Crawford believes rentalware will catch on at larger companies, especially at the department level.

"It's great because no longer do you have to go to IT and beg and wait in line," she said.

"Now if you have a need for a project management tool, you've got it."

Greg Loder is an IT manager at The McGuffey Project, a nonprofit organization dedicated to identifying and supporting technology education leaders. The project has been serving 140 end users, but will soon expand to some 4,000 as part of the Clinton administration's 21st Century Teachers initiative.

"We don't have the technical expertise to run and host [an intranet] and provide the security and do all those other things," Loder said.

Using In-Tandem allows his organization to "really focus on what we need to do, which is provide the content, monitor conversations and build the grassroots through the site," he said.

Although bullish on the concept, Kinetic's Boyle said vendors pushing rentalware can expect resistance.

"The mentality in IS has been buy, deploy ourselves and keep our jobs," she said. "Where's my job if they can get this from outside the company?" ■

DOES RENTING GROUPWARE MAKE SENSE FOR YOU?

Benefits:	Drawbacks:
Lower up-front investment costs	Choice of vendors limited at this time
Application development burden taken off IT departments	Functionality not on par with more popular groupware products
Smaller organizations spared administration costs	Security concerns inherent with the Internet
Product upgrades available immediately and easily	Bandwidth limitations may affect end-user experience

CORRECTIONS

In the "Cisco cranks up Fast Token Ring" article published in the May 26 issue (page 1), *Network World* mistakenly reported that FDDI requires fiber. FDDI also runs over Category 5 unshielded twisted-pair cable.

Also, because of an editing error, the column "Religious Conversions" in the May 26 issue (page 40), overstated the forwarding latency of Bay Networks, Inc.'s Switch Node. The correct latency, as measured in the Harvard Network Device Test Lab, was 72 microseconds, not 72 milliseconds.

Finally, in our last server review (May 26, page 49), the weighting of our performance ratings should have been 30% file server; 60% database; and 10% Web server. Data General Corp.'s three-year, on-site support is standard, not an option. And DG offers IntranetWare with the Aviion 3600. The server costs $27,444.

Microsoft bolsters Internet Explorer security

The company's Web browser now lets users designate "security zones" across intranets and the 'Net.

By Carol Sliwa
Redmond, Wash.

Beleaguered by its Web browser security problems, Microsoft Corp. last week took additional steps to try to assuage users' concerns.

The company announced a new Internet Explorer feature called "security zones" that will help users and administrators set policies for accessing Web sites.

MICROSOFT'S SECURITY ENHANCEMENTS

- Authenticode 2.0 technology
- Capabilities-based security for Java
- Certificate management
- Security checkup Web site
- Security zones

The feature will let Internet Explorer customers carve the Web into four predefined zones: intranet, trusted extranet, general Internet and untrusted. Administrators can then define which Web sites are part of which zones and set the levels of security they want to assign to pages from those zones.

For instance, ActiveX Controls and Java applets coming from the 'Net might be assigned to untrusted zones, and users might not be allowed to download them.

On the other hand, users might be granted unlimited access to trusted zones, such as a bank's Web site.

In conjunction with security zones, Microsoft will add a security feature for Java that lets users or network administrators decide which functions and what access they want to give Java applets.

From Netscape and Sun

Netscape Communications Corp. has announced a similar feature in its browser. Netscape's client software supports signed objects.

Developers who want to write applications that go outside the Java sandbox, which prevents Java applets from accessing local system resources, can cryptographically sign a piece of code and specify the capabilities they want the object to have.

A user's machine can be configured to accept only objects that are signed by trusted sources.

Like Microsoft and Netscape, Sun Microsystems, Inc. also is developing a security model for Java, due out this summer, that potentially could cause compatibility problems.

But Sun security staff engineer Marianne Mueller said the technologies are accomplishing similar purposes, and she hopes all the parties will be able to "roll up their sleeves" and work out an interoperable solution.

"Sun's a day late and a dollar short," said Cornelius Willis, Microsoft's director of platform marketing. "They have not got their act together on capabilities-based security in time to influence the major releases from the two browser vendors."

More pieces

Other pieces of Microsoft's browser security plan include Authenticode 2.0 technology, which requires certificates to be checked with an authority to make sure they are still valid.

In addition, administrators will gain more control over which certificates can be used.

All new security features will be available in the next prerelease version of Internet Explorer 4.0, which Willis said is due in six to eight weeks. ■

New Communicator, SuiteSpot releases face customer scrutiny

By Carol Sliwa
San Jose, Calif.

Netscape Communications Corp. will reach an important milestone this week when the company ships final versions of its Communicator groupware client and SuiteSpot 3.0 server software, which it has been promising since last year.

Communicator 4.0, Netscape's attempt to offer much more than a browser client, also includes e-mail, collaboration and Web authoring components. Optionally, it contains conferencing, calendaring, 3270 terminal emulation and management tools. SuiteSpot 3.0 features nine servers, including new Enterprise, Messaging and Collabra servers.

For some customers, particularly those in dire need of new mail systems, Communicator's release could not have come a moment too soon. For months, they have been testing the software, which most said is stable enough to begin deploying once it is released at the Developer Conference here.

But not all of Netscape's corporate customers are so eager. Some have not even gotten around to testing the new products. Others see no business reason to make a switch just yet. And some want to wait for more mature versions.

One of Netscape's large corporate customers, for instance, said he would recommend that his company wait for the ".01" version of the client, based on inconsistencies he noted in the most recent beta.

"It just doesn't seem to have the feel that it's quite production-ready yet," said the user, who asked not to be identified. "[Netscape pursued] an ambitious schedule and I'm wondering what the big drive is behind it, except that Netscape wants to get mindshare before Microsoft comes in with its next release."

A promoter of cross-platform products, Netscape will release Communicator first on Windows 95 and NT. Unix and Macintosh releases will follow later in the month, the company said.

But Communicator will be missing the Netcaster push component that the company initially claimed would be ready. Product manager Tim Hickman said a second Netcaster beta is due within two weeks, with the final version expected to ship within the next six weeks.

For most customers, that will not be a bother. But Netcaster's delay will not draw them to Netscape's side, either.

"The biggest component that would push us over to Communicator today would be Netcaster," said James Chung, an IS manager in charge of Web publishing and information delivery at Bay Networks, Inc.

When Bay licensed Netscape's client, the company did so strictly on the basis of the browser. Because that browser is still working fine, there is no pressing business need to upgrade to Communicator, Chung acknowledged.

Because Bay uses QualComm, Inc.'s Eudora e-mail client and has standardized on Microsoft Corp.'s FrontPage Web authoring tool, there is no urgent need to check out those Communicator components either, Chung said.

National Semiconductor Corp. is very interested in using Netscape's latest Enterprise Server to be able to talk to the Lightweight Directory Access Protocol-enabled Directory Server.

"We're going to use [the Directory Server] for a single sign-on for the intranet, so there'll be one user name space for the whole enterprise," said Glenn Newell, a senior engineering manager of intranet technology at National Semiconductor.

Newell reported no problems with the server products to date.

The experience has been similar for Jeppesen Sanderson, Inc., which produces flight charts for airline pilots. The Enterprise and Directory servers have been stable for the last 60 days, said Larry Bolnick, manager of corporate IS.

Bolnick, however, remains skeptical about the initial Communicator release, based on the most recent beta and his past history with initial software releases.

Sandy Sully, chief information officer of San Jose-based Xylinx, Inc., has a different take on things. "My people have been testing [the mail product] from [Preview Release 1] through PR5, and the feedback I got last week is PR5 is really good," said Sully, noting Xylinx plans to roll out products as soon as it can.

Sully said Xylinx has not had a good mail strategy, and Netscape's Internet-based system featuring Internet Message Access Protocol 4, rules capabilities and hierarchical folders will provide relief. ■

Netscape's *new Communicator client can be downloaded from the company's Web site.*

Netscape software will change the Internet

Analysis

By John Cox

Netscape Communications Corp. this week will add into its two most popular Web products software that will let corporate application developers rapidly build the next generation of Internet applications.

Netscape's Enterprise 3.0 server and Communicator 4.0 browser will include an object request broker (ORB), licensed from Visigenic Software, Inc., of San Mateo, Calif., that will let application developers for the first time create networked applications consisting of reusable object-based software pieces. The Web server also includes a full development environment for building new objects in C++ or Java.

All ORBs create a client/server connection between objects, so one object can activate and use the functions of other objects on the network. The Visigenic ORB, like most others today, is based on an industry specification called the Common Object Request Broker Architecture (CORBA). This standard also describes a set of application services, such as directory and transaction services, and a communications protocol called the Internet Inter-ORB Protocol (IIOP).

For Netscape customers, IIOP now replaces the standard HTTP protocol. The built-in Visigenic ORB becomes the de facto standard for gluing together CORBA objects over the Internet.

The Netscape products will be the first large-scale test of IIOP's performance and its ability to work with different ORBs from different vendors, said Marky Roy, principal consultant with Semaphore, a North Andover, Mass., object technology services company that has been working with the new Netscape products.

"The ORB gives you the ability to build applications that go beyond the limitations of Web servers," said Vikas Rijsinghani, president of Neoglyphics Media Corp., a Chicago-based Web development firm and a beta tester of the Netscape products. "Now we can develop true applications using the 'Net. With the CORBA ORB, it lets us distribute [application] functionality across the network."

This is a far cry from today's typical Internet applications, which mostly involve downloading HTML pages or database information automatically generated in response to a browser request.

Customers who have built CORBA objects can use the new Netscape products to forge a Web connection to them right away, said Basil Hashem, senior product manager for Netscape Enterprise Server 3.0. Others can use the server-based development tools to start building new object-based services or object "wrappers" for accessing legacy systems from the Web.

"What Netscape realizes is that the browser today can access Web sites and office application suites, but the access to real, mission-critical, business applications is where the ORB fits," said Michael Kennedy, vice president for advanced information management strategies, META Group, Inc., a Stamford, Conn.-based market research firm. ■

Corel NC gets Java injection

By John Cox
Ottawa

Corel Corp.'s computer subsidiary Corel Computer Corp. last week said it is licensing third-party Java software to power its upcoming video network computer (VNC), which is optimized to handle video and audio in addition to data.

The SoftNC Java technology, from TriTeal Corp., will enable VNC users to download a client applet containing a Java Virtual Machine, along with agent-based applications and a messaging system. The VNC can access other Java applets, as well as Windows and Unix applications, depending on its configuration.

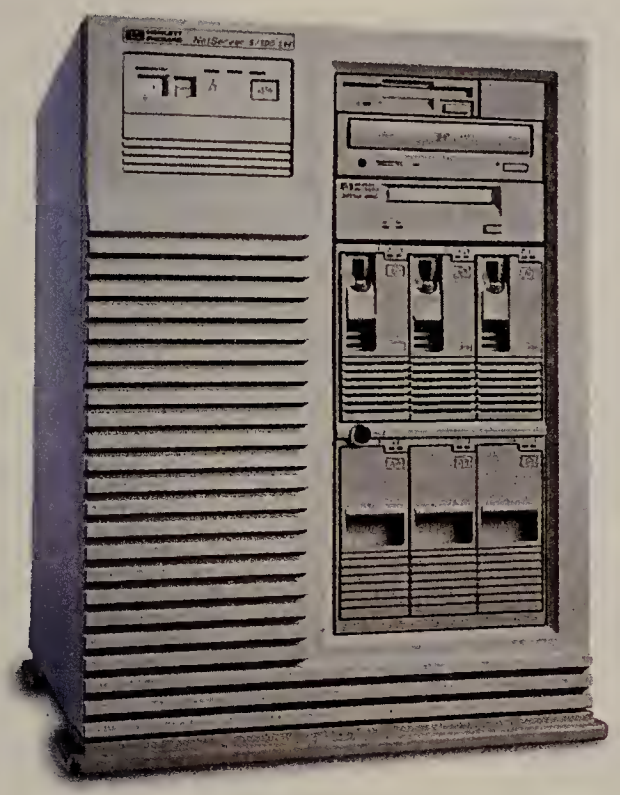
The VNC also will come outfitted with video software and a camera, enabling the device to exploit PC video conferencing technology created by the parent company. The VNC is designed as an alternative to Windows PCs.

"We believe people will want to use the NC as a communications device, and that includes voice and video communications," said David Madden, director of product development for Corel Computer Corp. However, customers may have to upgrade their networks to switched Ethernet and install a video gateway, he said.

✆ Corel: (613) 728-8200

Where will token ring go from here?

Network World and The Tolly Group are convening a roundtable of leading token-ring vendors on June 17 in Spring Lake, N.J., to explore the state of the token-ring market and the technology's future. If you are interested in participating in the Token-Ring Futures Roundtable, send e-mail to nwnews@nww.com.



HP's Midrange NetServer LH Pro

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Good Java programmers are hard to find

Intranet project managers forced to offer developers good money.

By Ellen Messmer
New York

With the economy booming and new intranet projects being launched every day, corporations have become embroiled in a fierce bidding war to hire developers skilled in Java and other object-oriented languages.

The fact that demand for this new breed of programmers is outstripping supply was obvious last week at Object Expo here.

More than two dozen corporations, including high-tech industry headhunters, set up a long line of booths inside the shabby New York Coliseum to woo the roughly 500 programmers at the show. But even the 3-foot-high placards posted by New York-based recruiter LinkPoint — advertising "object-oriented software specialist $100K+," "C++/Java developer $70-90K" and "intranet developer $60-77K" — attracted only a small amount of polite interest from programmers ambling by in jeans and T-shirts.

The programmer shortage is causing companies to delay important application projects. GE Medical Systems, for instance, is having a hard time finding the Java or C++ experts it needs to redesign its Magnetic Resonance Imaging scanners to make them more network-aware. The company was having "zilch" success attracting programmers at the show last week, said Eric Stahre, manager of Magnetic Resonance software platforms and applications at GE Medical Systems.

"Unix and the more traditional skill sets still represent 70% of the market, but the future is the Web," says Select Group's Bill Griffiths.

Programmers are more inclined to work on a temporary, hourly basis than to sign on for a long-term commitment, such as redesigning the scanning system, Stahre said.

Others said they are running into the same problem, finding that programmers would prefer to take short-term jobs that can pay $75 or $100 an hour.

"We'd rather hire full-time employees, but sometimes we can't," said Susan Donnelly, senior human resources representative at ARINC, which builds and operates networks for the airline industry. "There's a huge demand for C++ and Java programmers now, more demand than supply."

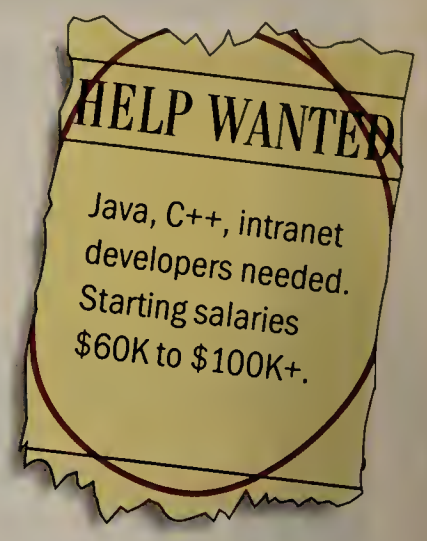
Though the SmallTalk programming language doesn't get the same press hype as Java, the demand is there, too, said representatives from integrator American Management Systems, Inc., recruitment firm Precision Software Design and insurance company Chubb & Son. All of these representatives were scouting for SmallTalk programmers.

"We've already trained over 100 of our programmers in SmallTalk, but we need more," said Mario Stassi, an information technology program manager at Warren, N.J.-based Chubb.

Dow Jones also sees a bull market for object programmers. "Dow Jones is looking for C++, Java, SmallTalk programmers — lots of them," said staffing manager James Nolley. "We're adopting an open systems architecture and Internet protocols."

"Finding a Java guy can be hard," said Bill Griffiths, a recruiter at Select Group, a decade-old headhunter based here that specializes in placing high-tech help at financial firms.

"The financial community pays the highest dollar, but is the



least tolerant of performance ineptitude," he said. "Unix and the more traditional skill sets still represent 70% of the market, but the future is the Web."

With a dwindling pool of U.S. candidates to fight over, some recruiters are going to countries such as Russia to find programming talent. "They might make $500 per month in Russia, but here it's $100,000 to $120,000 per year," said Mila Manashirov, vice president of Concepts in Staffing, Inc. in New York. ■

Net Result: Millions of new jobs

Study shows the Internet and intranets will boost the GNP.

By Chris Nerney

DRIVING THE ECONOMY

'Net-related industries, along with the telecommunications and network industries, could contribute as much as 12% to the gross national product by the year 2005.

The Internet and intranets could be responsible for between 25% and 40% of new U.S. jobs by the year 2005, according to a new study.

That means anywhere from 3 million to 5 million 'Net-related jobs could be created in the next eight years, assuming an overall economic growth rate of 1.5 million jobs annually, said Robert Cohen, the study's author.

NETTING NEW JOBS

Projected number of new jobs generated by the Internet and intranets under different growth rate scenarios:

Growth Rate	2000	2005
Low	0.9	3.0
Medium	1.2 - 1.3	3.6 - 3.9
High	1.3 - 1.4	4.4 - 5.1

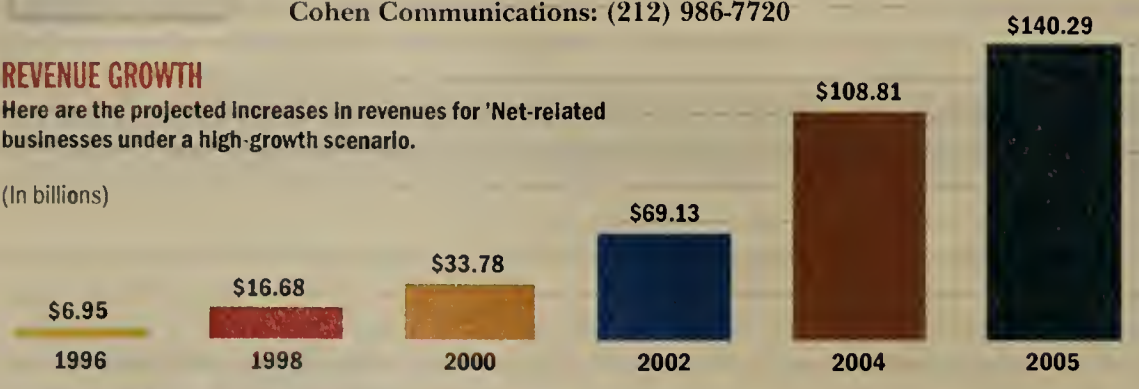
Cohen runs the Cohen Communications Group consultancy in New York and was an economic adviser to President Bush's National Advisory Commission on Semiconductors. The survey was conducted for the European Commission, which was interested in the impact of Internet technology on the U.S. economy.

The study, "An Economic Model of Future Changes in the U.S. Communications and Media Industries," was based on data drawn from reports by Wall Street firms such as Smith Barney, Inc., Morgan Stanley & Co., Inc. and Merrill Lynch & Co., Inc.

Cohen Communications: (212) 986-7720

REVENUE GROWTH

Here are the projected increases in revenues for 'Net-related businesses under a high-growth scenario.



SOURCE: ECONOMIC STRATEGY INSTITUTE, WASHINGTON, D.C.

Linking LANs to the 'Net in the sky

By Denise Pappalardo
St. Paul, Minn.

Satellite Internet access is not just for individual users anymore. Two new services that will use satellites to connect LANs to the Internet will roll out this summer.

DigitalXpress, a relatively new company, will roll out its XpressNet satellite-based Internet access service this August. The service will allow network managers to link LANs in far-flung locations to the Internet at 512Kbit/sec.

Satellite-based Internet access services can offer users a reliable connection, but costs can be an issue, said Fred McClimans, president at Current Analysis, Inc., an Ashburn, Va.-based consulting firm. You may be able to get Internet access to a LAN in the middle of a desert somewhere, but you will pay a premium, he added.

New DigitalXpress customers will pay about $1,500 to get started. The service requires users to purchase a receiving dish and an integrated receiver decoder device. In addition to the one-time equipment cost, users need a dial-up land line connection to Franklin Telecom's Internet Passport service, which costs $29.95 per month.

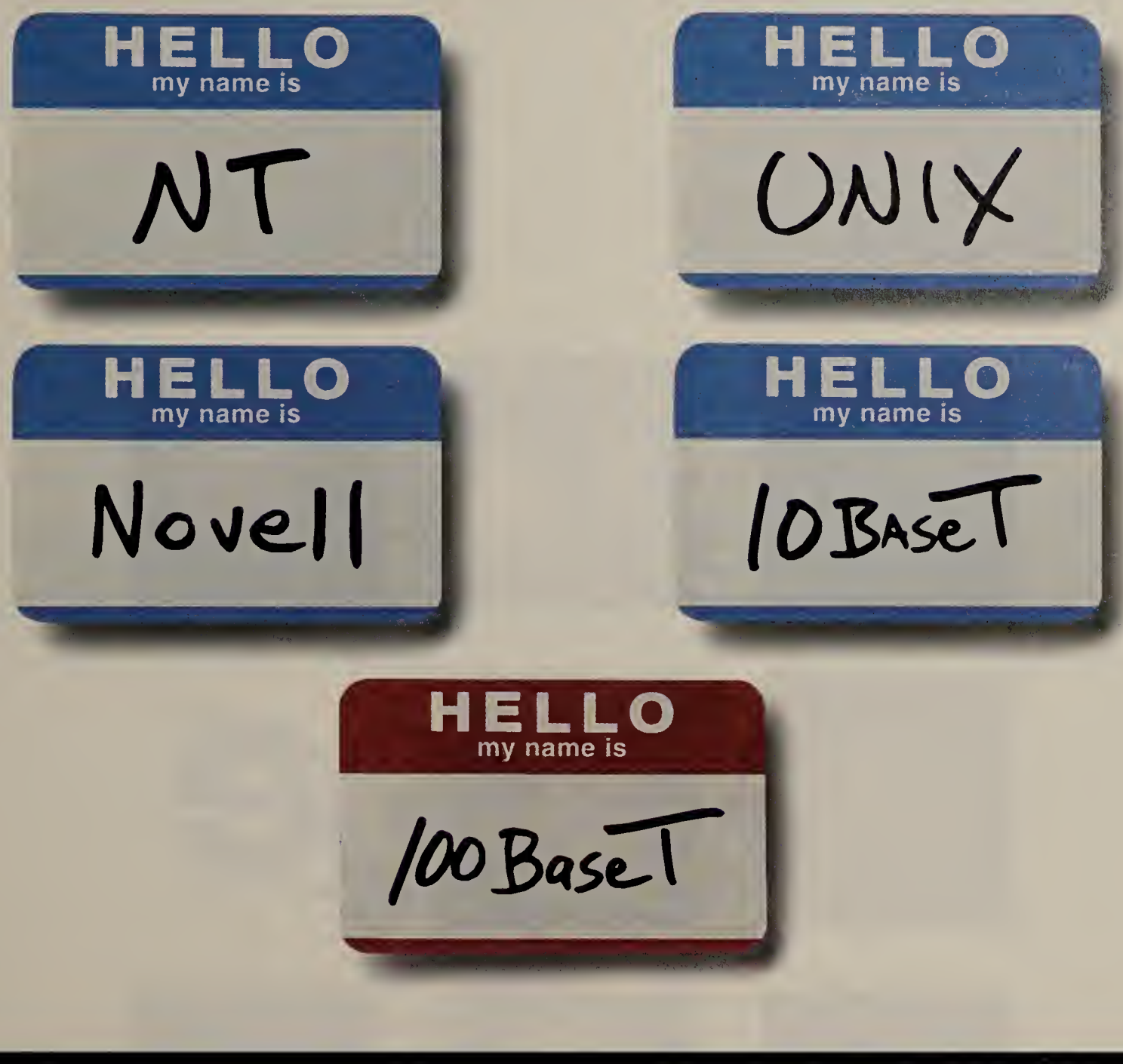
Additional monthly fees include a $50 charge for sending traffic upstream through the satellite and a usage charge of $39.95 for every 100M bytes of traffic sent through the satellite. As the World Wide Web moves to graphics, animation, video and sound, the megabytes and bucks could add up.

Satellite pioneer Hughes Network Systems (HNS) is expected to give its DirecPC Internet access service a face-lift this summer.

HNS currently offers a LAN-based Internet access service, called DirecPC Network Edition, but it is limited to NetWare LANs. This service supports Internet access speeds of 400K bit/sec. HNS plans on releasing a Windows NT version by fall, said Andy Wohl, senior director for business development at HNS, broadcast products and services division.

Although DirecPC's service is less expensive than XpressNet, the price tag is still significant. The one-time equipment investment is $399, which includes a receiving dish and an ISA card. Software costs $1,125 for a five-user LAN and $1,500 for a 10-user LAN. DirecPC Network Edition charges $24.95 for every 64M bytes of traffic sent over the satellite.

Like XpressNet, Network Edition requires users to have a dial-up connection to an ISP. ■



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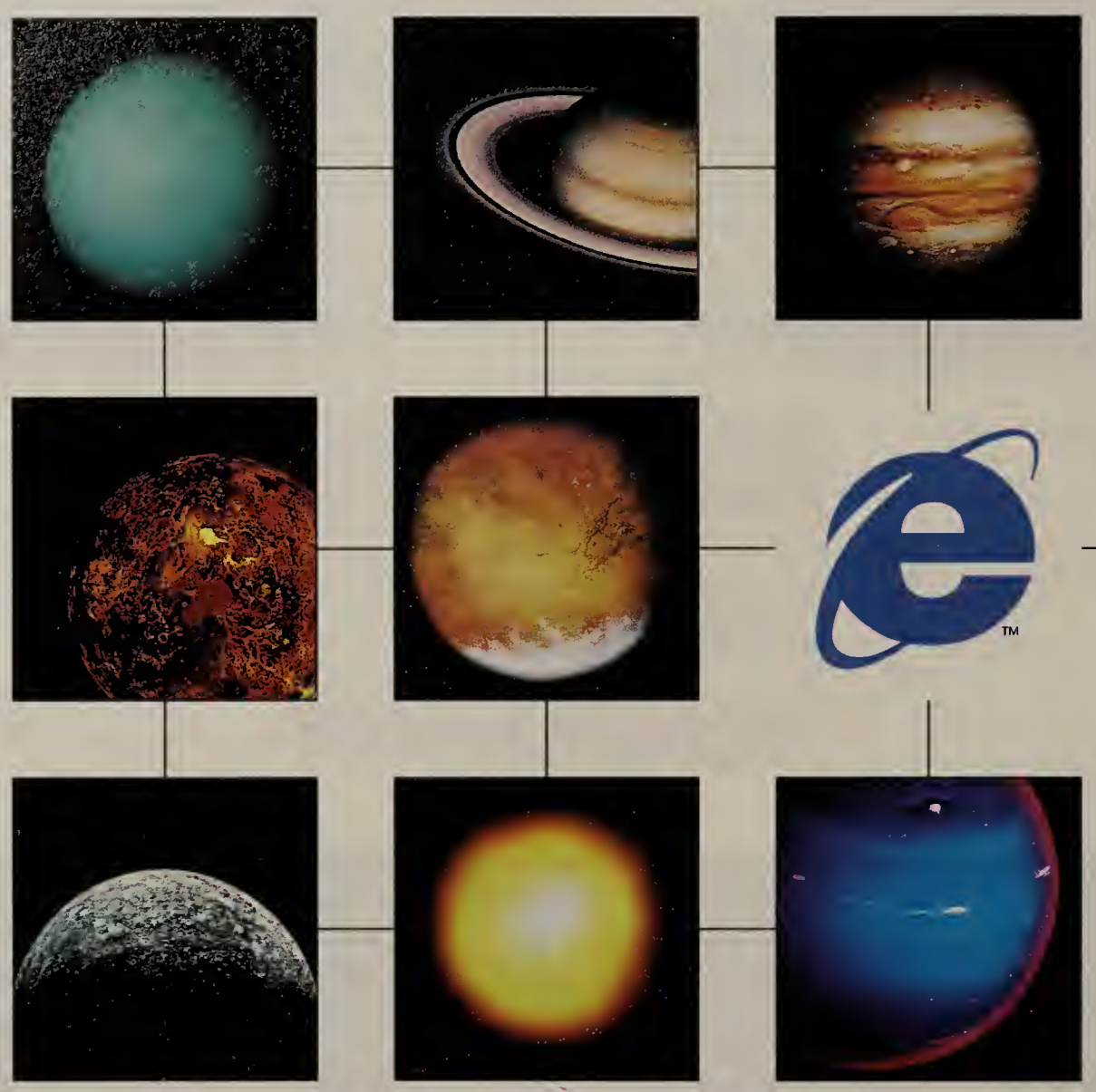

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Microsoft surprise: A new way to link Java

By Ellen Messmer
New York

Microsoft is backing away from its much-vaunted Common Object Model for a critical function: tying Java apps to Windows.

In its place is "@dll.import," a new technology for accessing Windows code that may replace the COM interfaces used today.


JavaSoft's *Cable*

The @dll.import technology will debut in the next version of Microsoft's Java Software Development Kit (SDK), expected out in a month, said Kevin Miller, lead program manager in the applications and Internet client group at Microsoft. Microsoft said the tool has no larger implications for COM.

The key point of @dll.import is to link Java programs to non-COM-based Windows Dynamic Link Libraries (DLL), which are sets of compiled code that can be loaded and unloaded on demand.

"This will be easier than the COM way of doing things. It's hard to access native DLLs in some cases with COM, and in other cases, unimaginatively painful," Miller said.

COM, which Microsoft program manager Greg Dimescheli described as a framework for running components on multiple platforms, is a method of expressing interaction between distinct functional pieces.

However, COM does not effectively solve the software problem of getting what is known as C, C++ and Java "types" — the dictionary definitions of what component functions do — to work together, acknowledged Miller.

"The No. 1 cause of performance nightmares comes from marshalling to a new thread every time you cross from native code to Java."

Microsoft's own internal tests have highlighted some severe COM-to-Java conversion problems. In addition, there are problems in the way Java's memory allocation mechanism, called the garbage collector, deals with objects written in COM.

Miller, who had been scheduled to present a talk entitled "Effectively Using Java with COM and ActiveX" at last week's Object Expo conference here, told his audience of programmers he was dumping the subject of the talk because Microsoft had just found a better way.

"[The @dll.import] answers a lot of the problems we've had in writing Java code," said Microsoft's Kevin Miller.

"The @dll.import will provide easy access to Win32 DLLs and third-party DLLs," Miller promised. "It answers a lot of the problems we've had in writing code in Java."

The COM technique for accessing native Windows code in Java, called the Raw Native Interface (RNI), requires the programmer to manually manage the garbage collection, Miller said. "But @dll.import automatically does the garbage collection for you, automatically moves the types across from one side to another," Miller said.

Sun Microsystems, Inc.'s JavaSoft division has urged companies to stick to "100% Pure Java" and not use COM — which is the basis of ActiveX — since it renders an application platform-dependent. For instance, the Sun Java Virtual Machine, available in Sun's HotJava browser and its Java Development Kit, cannot import COM objects, although Microsoft's Java Virtual Machine can.

Sun claims @dll.import is no better. "This is sad," said JavaSoft senior staff engineer Larry Cable. "They've found a new way for people to lock themselves into the Windows environment." ■

Cisco pumps out high-end dial access system

By Jim Duffy
New Orleans

Cisco Systems, Inc. last week announced a dial access system for service providers and large enterprises that can handle more than 10 times as many calls.

AccessPath-TS, introduced at SuperComm '97 here, combines routing, high-density dial access and high-speed data back-haul in a single platform.

Cisco said the device is the first in a series of modular, stack-based dial access systems. But analysts said it is an interim product and that Cisco is expected to roll out a high-density AS5X00 dial access platform later this year.

AccessPath-TS incorporates a high-speed interconnect system with a switching capacity of up to 3.6G bit/sec and can be configured to connect more than 700 ports simultaneously.

Cisco's current high-end dial access server, the single-chassis AS5200, supports up to 60 simultaneous calls.

According to service providers, AccessPath-TS can help them save money by enabling them to consolidate points of presence (POP).

"It's a lot cheaper just to draw telephone lines down to a central point than to set up a POP in each individual location like we had been doing," said Shaker Setty, manager of corporate development at Logical Net Corp., an Internet service provider in Albany, N.Y.

All AccessPath-TS components are integrated in a self-contained rack cabinet that includes cabling, a rack component patch panel and a network management system. The stack includes a Cisco 7206 router that acts as a call process off-load server, enabling ISDN call termination and back-haul routing of data throughout the network.

AccessPath-TS is designed to go up against Ascend Communications, Inc.'s TNT and Bay Networks, Inc.'s 5000MSX access products. But analysts said AccessPath-TS was cobbled together to address high-density dial requirements until Cisco rolls out its AS5X00.

"It's good marketing because they don't have their big box ready and they have to be able to answer the density question," said Bobbi Murphy, an analyst at Dataquest, Inc. in San Jose, Calif. "This is obviously not what they would architect if they were starting from scratch."

Cisco AccessPath-TS will be generally available in 90 days starting at $133,000.

✆ Cisco: (408) 526-4000

FEATURES OF CISCO'S ACCESSPATH-TS

- Combines routing, dial access and high-speed data back-haul
- Supports more than 700 simultaneous calls
- Includes a 3.6G bit/sec switching fabric
- Helps service providers consolidate equipment and points of presence

Ipsilon lowers cost of IP Switching

By Jim Duffy
New Orleans

At the SuperComm '97 show last week, Ipsilon Networks, Inc. rolled out a low-end Fast Ethernet gateway for its IP switch and then used the occasion to unveil a slew of new alliances.

Ipsilon's FAS200 is a two-slot IP Switching gateway that can be deployed in end-user and service provider networks. It includes one or two high-speed Synchronous Optical Network (SONET)/Synchronous Digital Hierarchy links and connects up to four 10M/100M bit/sec Ethernet LANs at a customer site directly to a Ipsilon IP Switch ATM 1600 in a service provider network.

With the FAS200, service providers can deploy fiber Internet access to corporate customers. Service providers can also use the FAS200 in their own networks to provide Internet access to residential subscribers using digital subscriber line (DSL), cable or wireless transmission, Ipsilon said.

Analysts said the FAS200 will give users a lower cost entry into IP Switching than Ipsilon's current Fast Ethernet gateway, the 12-slot FAS1200.

"It provides a lower price point and smaller configuration for people to buy into for the edge of the network," said Fred McClimans, president of the Current Analysis consultancy in Ashburn, Va.

"Or for some organizations, it could be a very reasonable core switch," he said.

The FAS200 will be available in July. FAS200 components are priced as follows: the FAS-200 chassis costs $1500; Fast Ethernet Flow Modules offering as many as two ATM and four Ethernet/Fast Ethernet ports per unit are priced at $5,000.

New endorsers of Ipsilon's IP Switching technology include:

- Nokia, which announced a minority investment in Ipsilon, coupled with a technology agreement to develop broadband technologies for telecommunications providers.
- Hewlett-Packard Co., which introduced IP Switching flow analysis software for its HP Internet Advisor.

IPSILON'S NEW IP SWITCHING PARTNERS

- Amati Communications
- Copper Mountain Networks
- Diamond Lane Communications
- Hewlett-Packard
- Interport Communications
- Nokia

- Copper Mountain Networks, Inc., which announced a development partnership with Ipsilon whereby the two companies will deliver full-time connectivity to the Internet using DSL and IP Switching technologies.
- Diamond Lane Communications Corp., which announced full IP Switching interoperability across its Hitchhiker xDSL product line.
- Amati Communications Corp., which demonstrated how its Allegro ADSL Data/Video Access Concentrator can work with the Ipsilon IP Switch Processor to support IP traffic on an asymmetric DSL-to-ATM network.
- Interport Communications, which unveiled its new Internet Server Colocation services using Ipsilon's IP Switching hardware and quality-of-service software to add rate-shaping capabilities for controlling server-to-switch bandwidth.

McClimans said the alliances presage some IP Switching enhancements to come from Ipsilon. ■

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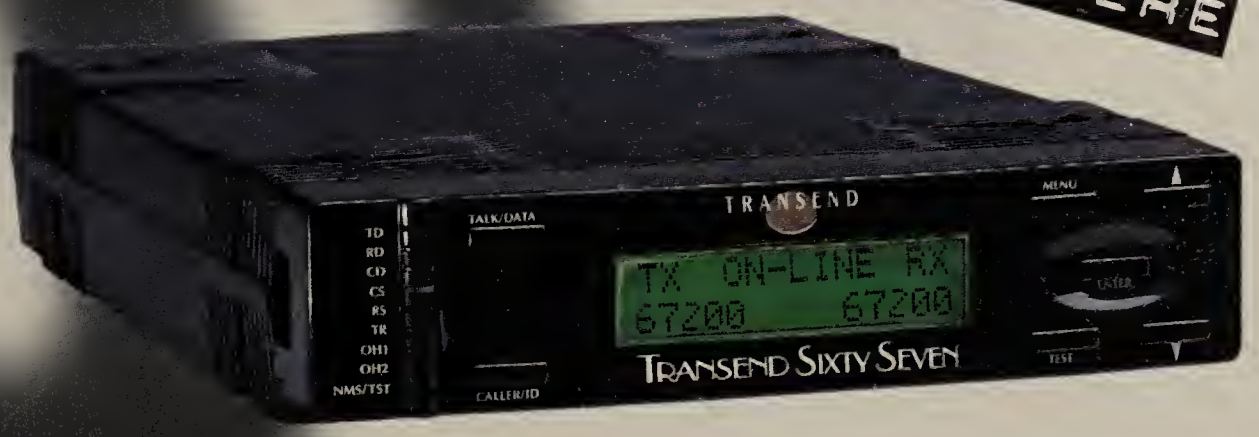

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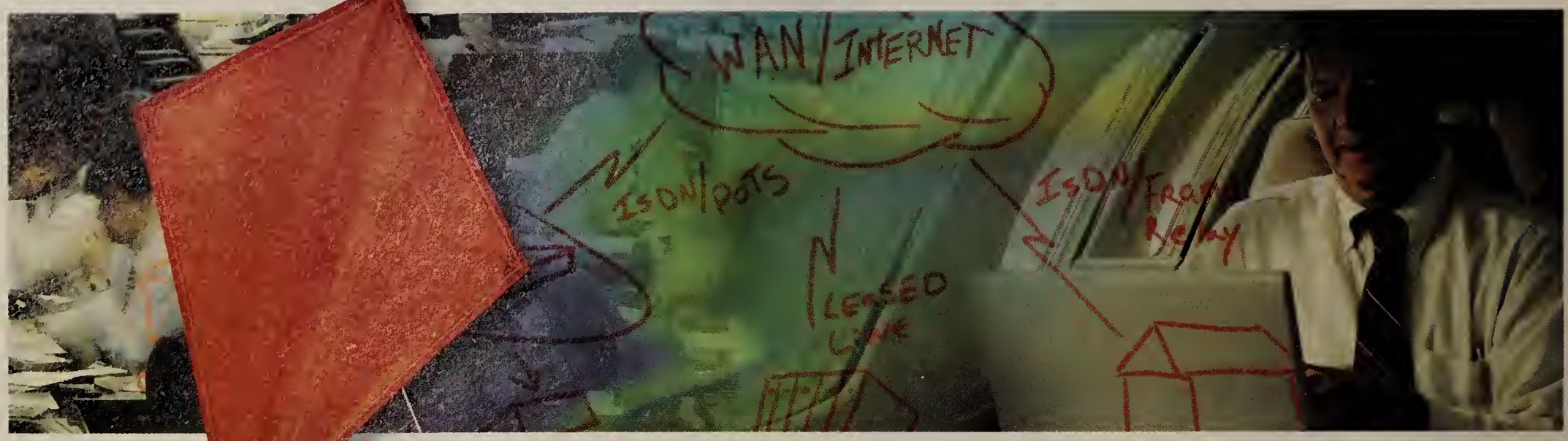

WAN/Remote Access solutions from Cabletron. A simpler way to work.

Putting together an integrated, cost-effective LAN/WAN strategy is a lofty challenge for today's network managers. Not only is it difficult to provide interoperability across existing equipment, but often there's no easy way to preserve security and keep bandwidth charges from flying out of control.

Fortunately, Cabletron rises to the occasion with industry-leading WAN/remote access switches. From scalable, high-end solutions at the central site to lower-priced devices for the home or small office, Cabletron's CyberSWITCH family and Netlink products provide seamless, end-to-end connectivity custom-fit to your exact requirements. ISDN. Frame relay. Analog modems. ATM. Leased line. X.25. You name it.

What's more, your solution is simple to set up and even easier to maintain. For instance, Cabletron's QuickSet enables telecommuters to configure their CyberSWITCH in a matter of minutes through a point-and-click interface. Support for most authentication servers ensures a secure enterprise through user IDs.

Performance is further elevated through Layer 3 switching embedded in every remote access device. You enjoy the speed of a switch with the firewalling and control of a router for unmatched reliability. In addition, advanced management applications let you track bandwidth usage and assign specific access privileges per user throughout the organization. Your WAN will deliver the same consistent benefits as your LAN environment.

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Briefs

■ *Woburn, Mass.-based* **Axis Communications, Inc.** *this week will unveil a family of* **storage servers** *for the company's 1G-byte Jaz disk drives, which can be attached directly to Ethernet or token-ring networks.*

The new storage servers could be used to replace some file servers. The Axis StorPoint HD for Jaz allows users to save data to independent Jaz drives on the network and permits shared access to those files.

The StorPoint HD stand-alone unit is priced at $999. The StorPoint HD/4 tower with Jaz drives will cost $2,999.

The products will be available by the end of July.

© Axis: (800) 444-2947

■ **Hewlett-Packard Co.** *last week introduced the HP JetDirect 150X, an aggressively priced* **print server** *designed for small businesses*

The server enables printers to be shared among users connected to a network file server in NetWare 3 or 4.X and Windows NT 3.5 or 4.X environments.

The JetDirect 150X is priced at $199 and is available now.

© HP: (800) 533-1333

■ **Mylex Corp.** *and* **NEC Corp.'s Computer Systems Division** *last week announced one of the first implementations of RAID on the motherboard (ROME), integrating Mylex's ROME chip set into NEC's Express 130D Pro Serva server.*

The companies claim this configuration lowers the cost of delivering hardware with RAID technology and frees a PCI slot for other applications.

© Mylex: (510) 796-6100

Cabletron widens the reach of its LAN switches

Vendor adds WAN uplinks to workgroup and wiring closet SmartSwitches.

By Jodi Cohen
Rochester, N.H.

Cabletron Systems, Inc.'s customers no longer have to rely on the likes of Cisco Systems, Inc. for all of their WAN needs. Cabletron is readying a LAN switch module that will give remote and branch offices access to corporate backbones.

Cabletron's SuperSwitch 2200 *workgroup and 6000 wiring closet LAN switches now support integrated WAN access capabilities.*

The module, announced last week, features two WAN uplink ports and is based on technology obtained by Cabletron through its acquisition of Netlink, Inc. in December. The offering will be available for Cabletron's SmartSwitch 2200 workgroup switch and SmartSwitch 6000 wiring closet switch.

By inserting the High Speed Interface Module (HSIM-W6) into the 2200, customers will be able to link their 10M and 100M bit/sec LANs to the WAN. The module provides the same capabilities for the 6000 chassis, which can house as many as five HSIM-W6 cards.

Each HSIM-W6 port supports full or fractional T-1, E-1, digital data service, synchronous or ISDN line interfaces. The module supports connections over frame relay and PPP.

Typically, customers would deploy the workgroup switch in a remote site and use its WAN module to take in traffic from feeder devices in other remote offices or send data up to a corporate backbone anchored by SmartSwitch 6000s. Each port on the WAN module can handle up to 32 circuits.

An inverse multiplexing feature allows users to balance traffic loads across the two WAN ports. The HSIM-W6 supports IP and IPX routing as well as multiprotocol bridging through the WAN.

One Cabletron user said that integrating LAN and WAN technology in one box could be beneficial.

"This would really simplify the number of vendors that we're dealing with," said Roland Voyages, director of technical services at NationsBanc Capital Markets, Inc., a New York-based bank. "It would also help us from a network management standpoint by having everything under one roof."

But Voyages already has a WAN based on Cisco equipment in place, so he doubts that he will deploy Cabletron's new module in his existing environment.

He did, however, say he would like to use the HSIM-W6 in the five new remote offices the company has planned, because they will lack in-house technical experts.

John Morency, an analyst at The Registry, a consultancy in Newton, Mass., pointed out that the frame relay interface will provide HSIM-W6 customers with the biggest short-term benefit. But even more significant features will be added, he said.

"Down the road, the HSIM-W6 will be expanded to include Cabletron's SecureFast [switching software] to provide integrated LAN and WAN switching capabilities," Morency said. "So customers will get LAN connectivity, switching and routing all within the same physical form factor."

Morency also said Cabletron's 2200 product — with 24 10/100M bit/sec switched Ethernet ports and two WAN ports — stands out from products such as the Cisco 2509 access server or Bay Networks, Inc.'s AccessNode hub, which offer only about 12 to 14 shared ports on the same router.

The HSIM-W6 is priced at $3,495 and will be available next month.

© Cabletron: (603) 332-9400

Novell-heavy management team named by Novonyx

By Torsten Busse
San Francisco

Two months after Novonyx's birth, parent companies Netscape Communications Corp. and Novell, Inc. last week appointed a management team that promised initial product shipments by the third quarter.

Novonyx *President and CEO Robert Hicks*

The management team is made up entirely of Novell personnel, starting with Robert Hicks, who was named president and CEO. Hicks is a former vice president and general manager of Novell's Extended Networks Division and the architect of the agreement with Netscape to form Novonyx.

The privately held Novonyx, a company based in Novell's backyard in Orem, Utah, will adapt, integrate and sell Netscape's SuiteSpot family of Internet server software on Novell's IntranetWare platform.

The SuiteSpot applications will be integrated with Novell Directory Services using the Lightweight Directory Access Protocol standard.

Hicks said the company has 12 employees and he expects to increase that number to 70 by the end of the year.

He declined to disclose revenue goals for the new firm.

Netscape has dedicated seven employees to the project to give Novonyx as much engineering support as possible, said John Paul, vice president of strategic partnerships.

These employees will ensure that Novonyx releases Netscape products on the IntranetWare platform at the same time Netscape delivers them on Unix and Windows NT.

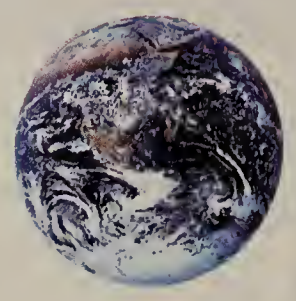
Novonyx will sell its IntranetWare versions of Netscape Enterprise Server 3.0 and Netscape Fast Track Server software, both slated for introduction in the third quarter of this year, via the same channels used by Novell and Netscape. These include value-added resellers, distributors and the Internet.

Rounding out the company's management team are the following:

- Thomas Creighton, former lead architect for Novell's NetWare Systems Division, was named vice president of engineering.
- William Donahoo, a senior director in Novell's IntranetWare products division, was appointed vice president of marketing.
- Ty Mattingly, former vice president of strategic relations for Novell, was named vice president of sales and business development.
- Steven Bentley, until now senior director of Novell's Extended Networks Division, will assume the role of chief financial officer at Novonyx.

Busse is a correspondent with the IDG News Service in San Francisco. Senior writer Christine Burns contributed to this story.

Your intranet has to run on what you have. Your browser has to make it run better.



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WIRED WINDOWS

The directory debate continues

Not long ago, I recommended that Windows NT network administrators get ready to implement Novell, Inc.'s Novell Directory Services (NDS) for NT, which is due to ship in the third quarter (*NW*, April 7, page 22).

The two reasons I gave for this were that NDS for NT was more mature than Microsoft Corp.'s planned Active Directory services and that NDS would be available almost a year sooner.

But it was pointed out to me recently that there are other NT network directory service offerings — from Banyan Systems, Inc., Netscape Communications Corp. and IBM — that are relatively mature or even shipping. What follows is my take on those offerings.

Banyan already is shipping StreetTalk for Windows NT 7.5 (it's really and Version 1.5 of the NT edition). The release includes improvements such as standards-based TCP/IP connections for servers. The software also features replication services and new administrator and user tools.

The drawback is the company has been extremely slow to adopt the Lightweight Directory Access Protocol (LDAP), which is being built into many important applications these days. Banyan plans to add LDAP support later this year but has not specified when it will be available.

Pricing also works against Banyan's offering. At $1,995 per server plus $70 per user, it is easy to spend more on the directory service than you did on the network operating system.

Netscape, meanwhile, is shipping the first edition of its Directory Server — touted as a native LDAP directory — and a new version out in the third quarter. I've read the documentation, and I'm still not sure what "native LDAP" means because LDAP is a protocol, not a directory definition like X.500.

Dave Kearns

The big problem with Netscape's offering is that it works in parallel with the NT domain directory, using synchronization to try to keep the same information in both, rather than allowing for a single directory service.

IBM's OS/2 Warp Server Directory and Security Services (DSS) are known to be more scalable and secure than NT's domain system. And now IBM has added Windows 95 and NT client support to DSS. But DSS has no integration with NT's domain system, and the offering requires installation of the Warp server.

Tip of the week

Microsoft has released a beta version of Point-to-Point Tunneling Protocol (PPTP) for Windows 95, allowing secure network connections through dial-up calls or via the Internet. For companies with lots of sites or mobile workers, PPTP is worth investigating as a virtual private network technology. More information is available at www.microsoft.com/windows95/info/pptp4w95.htm.

For the time being, my recommendation still holds: Get the early access version of Novell's NDS for NT as soon as it is available and give it a thorough test. It looks like the best NT directory system for the foreseeable future.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

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SPECIAL FOCUS

Windows NT

A multiuser OS multiple choice

By Christine Burns

The thin-client phenomenon has breathed new life into multiuser operating systems that can serve up graphical applications to clients of all shapes and sizes.

Network computer (NC) boosters argue that thin clients can help lower the cost of owning distributed clients and managing the Java-based applications they will run some day. Similar arguments can be made for multiuser operating systems, which can be used to serve up existing Windows applications to thin clients.

Nathan & Lewis' *Steve Krameisen went with WinFrame to simplify managment.*

Multiuser operating systems running on servers host client and client/server applications accessible to multiple end users simultaneously. The application code actually executes on the server, while only user interface screens are passed over the wire to the client machine via a specialized protocol. This configuration, which has been popular in the Unix world for years, gives administrators centralized control over all components of network applications.

To date, NT users seeking multiuser capabilities have had to look beyond Microsoft Corp. to third-party developers. The drawback with their products, however, is that they typically alter the NT kernel in a proprietary manner and require additional servers or run as add-on services on top of the NT server.

Microsoft has been slow to embrace multiuser technology, mainly because the company would rather see customers put as much processing power and Windows application software on the desktop as possible, says Neil MacDonald, an analyst at Gartner Group, Inc. in Stamford, Conn.

But Microsoft recently changed its tune, says Dwight Davis, editorial director of the "Window Watcher" newsletter in Redmond, Wash. Citing Microsoft's decision last month to license the industry-leading NT multiuser technology from Florida-based Citrix Systems, Inc., he says, "Customers have forced Microsoft to look at these [multiuser] systems as a cost-effective way to deliver networked applications.

"This makes it simpler for customers who want to stay under the [Microsoft] umbrella. There is no need for them to deal with new, incompatible Java applications running on NCs," Davis adds.

The market leader

Citrix is among the first companies to prove there is money to be made in the NT multiuser market. Since the company shipped the first copy of WinFrame two years ago, sales of Citrix's NT 3.51-based multiuser Windows application server have exploded. Revenue tripled from $14.6 million in 1995 to $44.5 million in 1996. The company has already registered $21.5 million in revenue in just one quarter this year.

Citrix turned NT into a multiuser operating system by licensing NT code from Microsoft and developing memory management and preemptive scheduling extensions.

Microsoft last month struck a $175 million deal with Citrix in which the two agreed to work together on a project, code-named Hydra, that is geared toward adding native multiuser capabilities to NT Server 5.0.

Citrix also has had great success in promoting its Intelligent Console Architecture (ICA) protocol as a standard means for passing Windows screen images over the network. ICA has been licensed to a long list of client software and hardware vendors, enabling users of everything from Windows 95 to Netscape Communications Corp.'s Navigator browser to get to Windows applications via WinFrame servers.

This widespread client support is one reason Nathan & Lewis Securities, Inc. selected WinFrame to give 800 remote users access to the financial firm's customized brokerage information application, NL Connection.

"My concern was always, 'How do I stay responsible for hundreds of different computers that are out there where my technical support staff isn't,' " says Steve Krameisen, director of information services at Nathan & Lewis.

The company has WinFrame installed in a three-tier architecture. NL Connection is a Windows application that runs on five WinFrame servers and is tied to an Oracle Corp. database management system running on an HP 9000 minicomputer. Brokers using PCs, laptops and wireless devices can dial in to NL Connection through a local CompuServe connection.

Krameison says the configuration does not render LAN-like performance and limits the brokers to one Window while accessing NL Connection. But the configuration is solid enough to help the firm manage $2 billion in investments annually.

Not the only game in town

Despite the success Citrix has enjoyed of late, the company is not the only game in town.

Insignia Solutions, Inc. ships Ntrigue, a repackaged version of WinFrame that includes support for non-Windows clients such as Unix workstations, X terminals and Macintosh computers. Insignia also manufactures Ntrigue X Client for Java, which allows Java-based desktops such as Sun Microsystems, Inc.'s JavaStation to run Windows-based applications housed on Ntrigue servers.

There are other products on the horizon that don't require any changes to the NT code to deliver some multiuser Windows capabilities. One of those is Prologue Software AG's WiNTimes, which Microsoft plans to build into its Hydra offering.

Another company, New Moon Software of Santa Clara, Calif., is prepping an add-on product called Liftoff that sits on an NT server and partitions the execution of 32-bit Windows applications between client and server machines.

Despite Citrix's recent success and the emergence of new third-party products, some analysts think Microsoft's Hydra technology will be the multiuser Windows application server of choice within two years.

"If [Hydra] comes in the box free and works well enough, there is no reason why companies are going to pay more for what should be a standard OS feature," said David Cearley, director of workgroup computing strategies at Meta Group, Inc. ■

THE MENU FOR MULTIUSER WINDOWS

Company	Product	Multiuser spin
Citrix	WinFrame	Complete server product that includes NT kernel altered with multiuser extensions and supports Citrix ICA protocol.
Exodus	NTPrise	Unix server-based product that presents Windows applications to multiple Unix workstations via X protocol.
Insignia	Ntrigue	Includes WinFrame technology and provides multiuser applications to PCs and Unix workstations via ICA and X protocols.
Microsoft	Hydra*	Project to integrate Citrix and Prologue multiuser code into NT 5.0. Will support ICA and Microsoft's T.Share video protocol.
New Moon	Liftoff	Add-on product that partitions execution of 32-bit applications between NT servers and their clients.
Prologue	WiNTimes	Add-on product that makes NT multiuser-enabled.
SCO	Merge	SCO UnixWare add-on product that presents 16-bit and 32-bit* applications to PCs and Unix workstations via the X protocol.

*Not shipping yet

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Briefs

■ **Cisco Systems, Inc.** *and* **Proginet Corp.** *last week announced their respective Cisco IOS for S/390 and Proginet software packages are interoperable. This means users can* **connect mainframes and nets running Windows NT** *using the Internet. Cisco IOS for S/390 is a mainframe-based implementation of TCP/IP. Proginet's HostOffice and SecureOffice products manage the movement of information between Microsoft Corp.'s BackOffice and IBM mainframes and AS/400s.*

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■ **CACI Products Co.** *last week announced the availability of Comnet Predictor, an* **automated network planning** *tool that predicts network performance without requiring extensive data input.*

Comnet Predictor includes a patent-pending Flow Decomposition technology that measures and forecasts delays for packet flows. The tool also generates reports and charts that recommend actions for improving performance and minimizing cost. Comnet Predictor costs $29,000.

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■ **SDL Communications, Inc.** *last week announced high-speed* **WAN adapters** *for emerging CompactPCI-based computers. SDL's new Aries line of single- and dual-port adapters will support a variety of speeds, from 28M bit/sec to T-3/E-3. The Aries adapters will be available this month and range in price from $795 to $5,995.*

© SDL: (508) 238-4490

■ **Cascade Communications Corp.** *has introduced Flow Control Processor cards for its CBX 500 ATM switch to help* **prevent delays within networks** *of its switches. During congestion, the cards throttle back traffic coming into the network on a per permanent virtual circuit basis. The cards are available now and range in price from $35,000 to $65,000.*

© Cascade: (508) 692-2600

SONET solves WAN problems for Northwestern

University gets more bandwidth, simpler management for the same price.

By Tim Greene
Chicago

Northwestern University's quest to prepare for a huge increase in bandwidth demand and to provide redundant paths for increasingly critical applications has led it to an uncommon solution: an OC-12 622M bit/sec Synchronous Optical Network (SONET) service from the local phone company.

The university's network was already unwieldy, with a patchwork of university-owned fiber, private lines and dial-up services supporting voice and data networking — none of which had backup if a line failed.

SONET LURES THE WILDCATS

Northwestern University went with an OC-12 Synchronous Optical Network (SONET) service to reap:

- Consolidated wide-area links
- Flexible bandwidth shared among voice, video and data
- Redundant trunking
- Guarantee of readily available additional bandwidth

It became clear that a network overhaul was called for when the university had to install an OC-3 (155M bit/sec) link to the Metropolitan Research and Education Network, a collaborative effort whose high-speed network is used to support advanced medical imaging, high-energy physics and computational biology and chemistry.

The solution was a SONET backbone network supplied by Ameritech Corp. and based on switches from Alcatel Network Systems, Inc.

Within the past year, regional Bell operating companies have started offering local SONET services, primarily as a carrier backbone and private campus technology. But those offerings are restricted to only the largest metropolitan areas (*NW,* Sept. 23, 1996, page 31).

For its new net, the university consolidated all of its voice, video and data traffic on the 622M bit/sec bandwidth it buys on Ameritech's SONET rings, according to Mort Rahimi, Northwestern's vice president for Information Technology.

He would not say exactly what the university is paying for the service, but said it was about the same as what it paid for its old network. For the same price, the university wound up with 155M bit/sec more bandwidth than before.

Rahimi was drawn directly to SONET, eliminating possibilities such as redundant private lines, based on the virtually limitless bandwidth fiber networks can supply as well as the redundant paths SONET provides. Like all SONET networks, Ameritech's is built on two fiber rings so if one fails, the other can restore service within milliseconds.

Before it switched over to SONET about a month ago, Northwestern linked its Chicago and Evanston, Ill., campuses via a DS-3 for voice and a DS-3 for data on an optical fiber strung along a railroad right-of-way. The link had no backup. Leasing another right-of-way to run a second fiber was too expensive, Rahimi said.

But even if leasing a redundant fiber path was not too expensive, the school's network was getting too complex, he said. Separate from the fiber connecting the campuses, Northwestern had 13 outbound DS-1 trunks and hundreds of individual inbound and outbound single-channel phone lines for voice. It had 11 DS-1 trunks for modem calls and two DS-1s just for Internet access.

Now all that traffic runs within various OC-3 channels carved out of the SONET service.

Voice DS-1s are set up as switched virtual circuits (SVC). Because the SVCs are torn down when there is no traffic, that leaves extra bandwidth for other uses during idle times.

For example, at night, when there is virtually no voice traffic, voice bandwidth is turned over to scientists in university laboratories who are working late using high-bandwidth applications Rahimi said.

Northwestern used to manage its own WAN links, but when it made the plunge into SONET, the university also off-loaded management of the SONET links to Ameritech, making the job of running the network simpler, Rahimi said.

Northwestern was able to abandon its private fiber link between campuses in Chicago and Evanston, lifting the burden of maintaining the cable and the risk of isolating the campuses if the cable were to break. ■

New offerings better manage servers, frame relay nets

By Jim Duffy

Two network management vendors have expanded their wares to help users more effectively govern servers and frame relay networks.

Concord Communications, Inc. this week will announce Network Health Server, an automated reporting system for tracking server performance and resources. And NetScout Systems, Inc. last week unveiled NetScout Manager 5.0 for monitoring, analyzing and reporting on frame relay application traffic, down to individual Data Link Connection Identifiers (DLCI).

The Network Health Server is software that runs on NetWare, Windows NT and Unix servers. It is designed to help IT managers spot potential server problems before users lose access to resources that support core business activities.

The software can be combined with other Concord Network Health modules — such as those for monitoring LAN/WAN, frame relay and router/switch connectivity — for an integrated, graphical report of all network resources.

Network Health Server reports on such server performance metrics as CPU, memory, disk storage, network communications and general systems-level utilization.

The product is available now for $6,000 per console and $250 per server.

For frame relay networks, NetScout announced NetScout Manager 5.0, software that runs on Unix servers along with network management platforms from Hewlett-Packard Co., IBM, Digital Equipment Corp., SunSoft, Inc. and Cabletron Systems, Inc.

NetScout Manager 5.0 collects SNMP, Remote Monitoring 1 and RMON 2 data, making it possible to monitor and analyze traffic generated by more than 100 standard applications and thousands of custom applications, the company said.

NetScout 5.0 is targeted at companies needing information that allows them to optimize performance of their contracted

frame relay committed information rates. With this information, administrators can ensure bandwidth is used effectively, control network availability and audit their service-level agreement with service providers.

NetScout Manager 5.0 and NetScout Manager Plus 5.0 will be available on June 20. The pricing ranges from $3,495 to $8,995.

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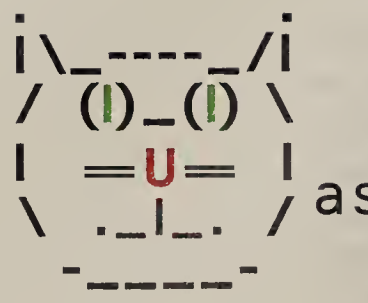

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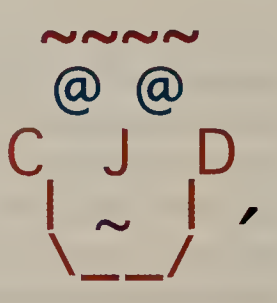

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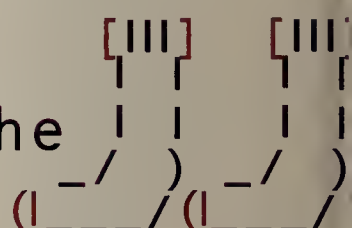

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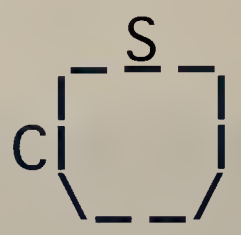

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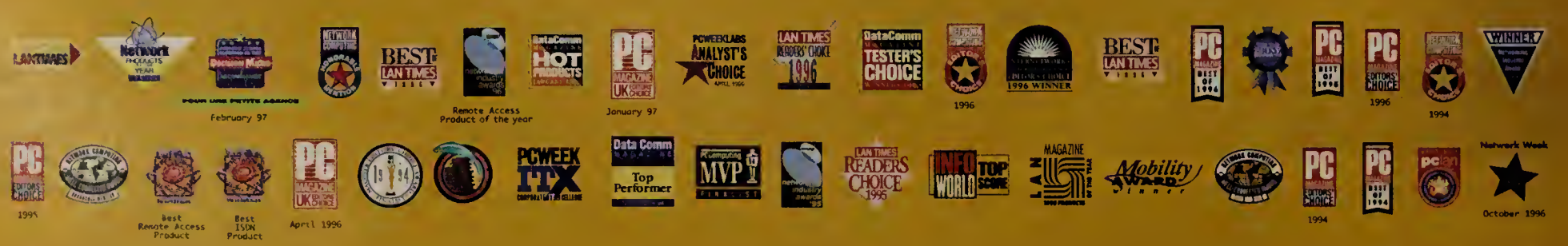

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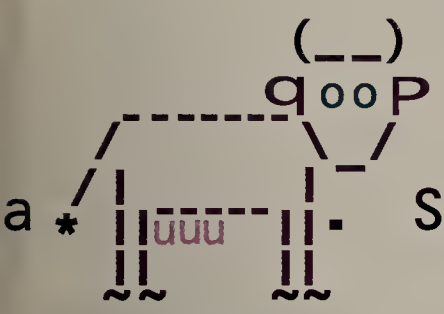

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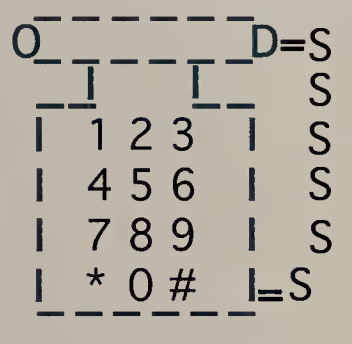
off the competition. :-D So get on the 

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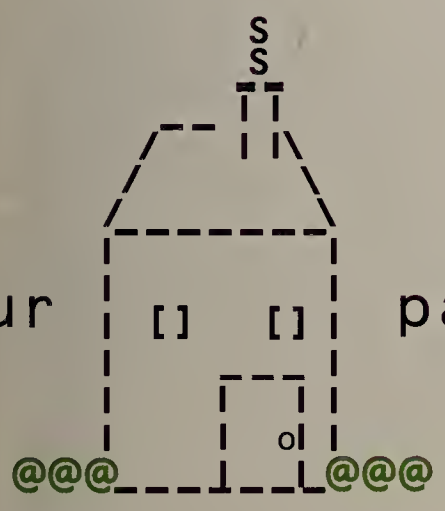
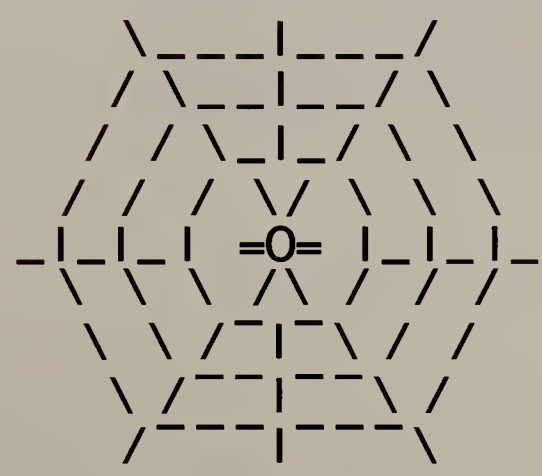
our 

page on the 

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INTERNETWORKING MONITOR

Lack of commitment could doom NIA

Not Invented Anywhere Syndrome: A more severe form of the Not Invented Here Syndrome wherein the originators of an idea or concept themselves reject it.

As it marks its first anniversary, the Network Interoperability Alliance (NIA) is finally getting some publicity — though not necessarily the kind it wants.

As I watch from the sidelines — I am not at all involved in this endeavor — I can't help but notice that what is going on within the NIA is not business as usual.

Consider the following examples.

In a recent *Network World* article, representatives of two vendors effectively undermined the NIA by questioning its accomplishments and making statements implying that they will not be bound by its charter (*NW*, May 5, page 1). What was strange was those quoted were employed by two of the three founding members of the alliance. Do I sense a solidarity problem?

Next, the NIA anniversary press release sent out in late May cited the fact that a well-known consultant has been involved in overseeing NIA testing at the University of New Hampshire. This obviously was mentioned to gain credibility for the effort.

Yet at NetWorld+Interop 97 in Las Vegas last month, a special session was held to detail and examine the problems of the NIA. What was bizarre was that the moderator of the session — who, one must suppose from the session description, intended to deliver some type of exposé on NIA ills — was the same person espousing the group's credibility in the NIA press release.

Kevin Tolly

Is the NIA rejecting itself? The signs are there. Judging from the less-than-vociferous support from vendors and analysts, its impact appears less than anticipated.

This is a sad state of affairs. Not because of what appears to be a botched execution on the part of NIA principals, but because what they are trying to do is fundamentally good — and needed.

The "dirty little secret" of the router era of the early 1990s was that interoperability was a joke. While openness and interoperability were standard parts of every vendor's pitch, little was actually done about it. Few if any high-functionality, multivendor router networks were ever built.

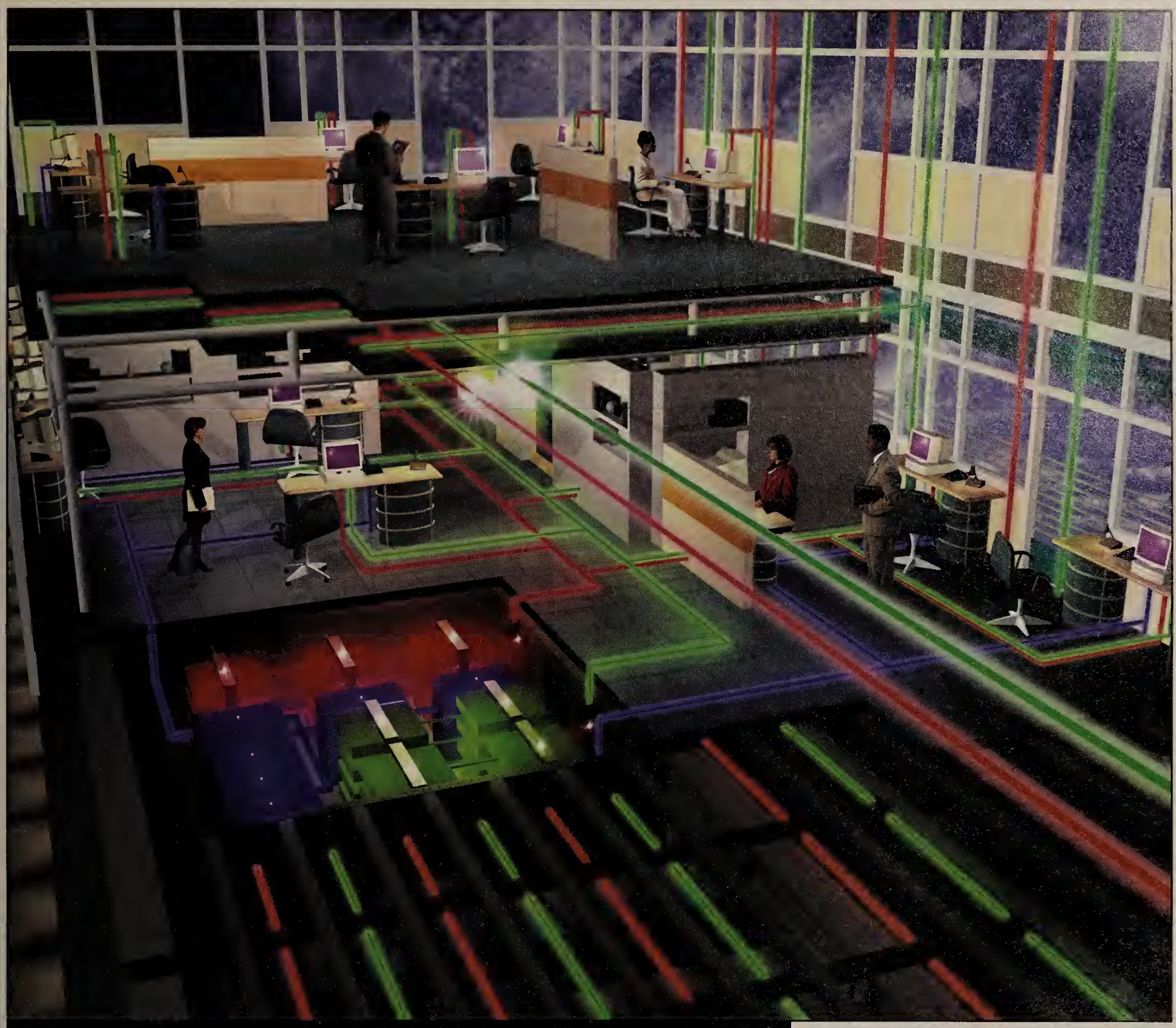
Router vendors with significant market share had little to gain by helping smaller vendors prove their "Brand X" products would work just as well — and cost much less — than, say, the Cisco or Wellfleet router alternative.

For their part, the more prominent vendors continued to work on advanced features such as prioritization and broadcast control to provide, naturally, advanced benefits for their customers. Was it just chance that to enjoy these benefits a 100% Cisco or Wellfleet network was required?

The monopoly Cisco now holds over networking is due in no small part to the fact that it was able to convince customers that mixing equipment from different vendors would not be in their best interest — or in Cisco's.

Those who scoff at the efforts of the NIA should consider the long-term prospects of living under a Cisco dictatorship.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (908) 528-3300 or via the Internet at http://www.tolly.com.



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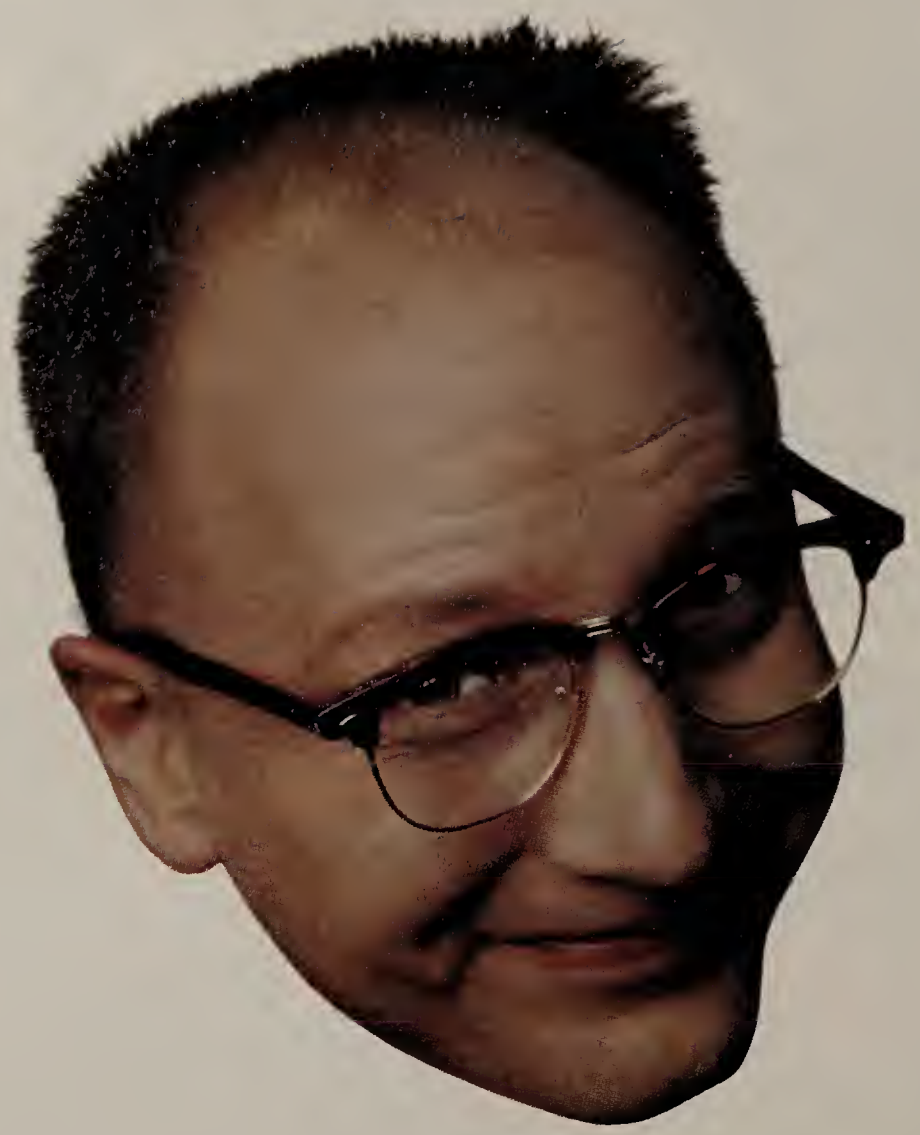

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HEWLETT PACKARD

Briefs

■ **PSINet, Inc.,** *of Herndon, Va., has* **appointed Michael Mael** *as general manager of its recently formed Web services and electronic commerce business unit. Mael has spent the past five years at MCI Communications Corp. as part of its commercial Internet services team and in a variety of finance, business development and marketing positions.*

PSINet's *Mael*

■ **AT&T WorldNet Service** *said it is making* **personal World Wide Web pages** *available to its subscribers. For a 2M-byte page, the service is free during a promotional period slated to end in late summer. Thereafter, subscribers will pay $1.95 per month for a 2M-byte page or $4.95 per month for a 5M-byte page.*

■ *In the latest battle in the war of words between local and long-distance carriers, the* **U.S. Telephone Association** *has established a Web site at www.callthemonit.com. The site explains how local carriers use revenue to invest in universal service.*

The site **responds to charges of inflated access fees** *trumpeted by MCI Communications Corp. in broadcast and print ads and on the Web at www.overcharge.com.*

■ **WorldCom, Inc.** *recently signed an interconnection* **agreement with Deutsche Telekom** *that will let WorldCom directly interface its MFS Communications fiber backbone with DT's network. WorldCom users that have ties with customers and business partners in Germany will be heard a little more clearly come Jan. 1 when the physical interconnection will be in place.*

The interconnection agreement is the first of its kind between a domestic and a post, telegraph and telephone administration.

Long-distance carriers seek RBOC performance agreements

By David Rohde
Washington, D.C.

While users are increasingly demanding performance agreements from carriers, some carriers have decided that such agreements are so important they want to apply them to each other.

Reason: Potential new local exchange carriers say they cannot build their local business until regional Bell operating companies get their ordering and maintenance systems up to snuff.

LCI International, Inc., the nation's sixth-largest long-distance carrier, is leading the charge to force RBOCs to sign binding agreements on how fast their automated systems can switch customers to new local carriers. The carrier is demanding that the Federal Communications Commission mandate specific performance levels, such as requiring RBOCs to process 95% of customer-change orders within three days. But not all potential new local carriers think that is the right step to take.

Sign on the dotted line

In sharply worded comments at a recent FCC open forum, LCI Senior Vice President Anne Bingaman said no RBOC is yet prepared to handle a significant quantity of orders from new carriers to switch customers. The FCC called the meeting to examine RBOCs' operations support systems (OSS), which include functions such as automated line assignment, testing and billing.

OSS support is considered critical because LCI and many other new local carriers are trying to enter the local market by reselling RBOC services instead of building their own local networks. Such new local carriers say they must have access to a fully electronic OSS interface with the wholesale carrier.

For example, Bingaman said, Ameritech Corp.'s OSS provides customer service records in what she labeled "free-form text," instead of a standard format, and without adequate specifications and documentation.

LCI Senior *Vice President Bingaman*

In addition, Bingaman charged, Ameritech takes up to seven days to deliver usage data on traffic passing through its switches for LCI customers. Depending on the billing cycle, this can result in a substantial delay for LCI customers in receiving their call detail reports. "The customers do not understand that it is not LCI's fault that items appear on their bills which are two months old," Bingaman said.

The OSS systems are also supposed to enable new local carriers to order piece-parts of RBOC local networks — known as unbundled network elements (UNE) — to help carriers that have have only built part of their local networks. But the RBOCs have "no track record" in allowing alternate carriers to order UNEs through their OSS systems, Bingaman said.

Not everyone agreed that the FCC should issue yet more telecommunications reform rules to solve any OSS problems. "The relationship between carriers should be contractual, not regulatory," said Kathryn Brown, associate administrator of the National Telecommunications and Information Administration, a branch of the U.S. Department of Commerce.

Ameritech Assistant General Counsel John Lenahan said his company would be happy to negotiate performance levels, but the FCC's role should be limited to comparing the level of service an RBOC provides to new carriers with the level of service it provides to its own customers.

That is not enough, according to Bingaman. "We need the commission to step in and set performance standards," she said. ■

New service tames the Internet beast

By Denise Pappalardo
Cupertino, Calif.

Users who wear several hats at their small to midsize business may find it easier to plug into the Internet with a new Web services package from Concentric Network Corp.

The company last week announced ConcentricHost, a bundled Internet access, Web hosting service that includes e-mail accounts, an Internet domain name and Web-based management software.

The service is available in three flavors: Home Office, Small Business and Premium. Each package offers increasing levels of storage space for Web content or additional e-mail addresses for more users.

"The services are designed for businesses that do not have a Web presence," said J.C. Dill, Web hosting product manager at Concentric.

Concentric has also streamlined billing by sending a single, itemized bill for all the services they use at a fixed monthly rate.

Crowded house

Concentric is not the first company to offer this type of integrated offering.

Netcom On-Line Communication Services, Inc., earlier this year announced a similar service that also offers users a single bill for multiple Internet services. Netcom's service, however, costs more than Concentric's Premium service. But Netcom's service includes additional Web site storage (see graphic).

Web-based management tools are one of the fundamental parts of bundled Internet access and Web hosting services, said Dan Taylor, senior analyst at Aberdeen Group, Inc., a Boston-based consulting firm.

Concentric's Domain Administration Web-based management software lets users add or drop e-mail accounts, change the amount of Web storage space they use and review old or current bills in real time, all from their desktops.

Companies that use Web hosting services still want to control their content and their users' accessibility to that content, Taylor said.

WNEM, a television station in Saginaw-Flint, Mich., chose the bundled service simply for the convenience it offers, said Ryan Renz, reporter and system manager at WNEM.

It is much easier and less expensive to work with Concentric than to set up a Web hosting and associated e-mail system in-house, Renz said.

✆ Concentric: (800) 939-4262

GIFT-WRAPPED INTERNET PACKAGES

ConcentricHost service offers users Web hosting and Internet access service packages in three flavors.

ConcentricHost service option	E-mail accounts	Web site storage space	Web site traffic per month	Dial-up Internet access	Monthly rates
Home Office	5	5M bytes	300M bytes	200 hours per month	$29.95
Small Business	5	10M bytes	300M bytes	200 hours per month	$39.95
Premium	10	30M bytes	1,000M bytes	200 hours per month	$59.95

Once, choosing a browser was a no-brainer.
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A Bell lends an ear; FCC seeks someone to steer

A couple of hot topics promise to make the summer sizzle.

Last month, several hundred large Southwestern Bell Corp. customers showed up in Houston — at the carrier's invitation — for an event dubbed Focus '97. The first of its kind in the region, the event was designed for carrier execs to meet with their most important customers to lay out future plans and get critical feedback.

The results were a mixed bag, according to participants. On the one hand, many users noted an improvement over the past year in some areas where Southwestern Bell has been notoriously weak.

On the other hand, many customers took the carrier to task for ongoing service problems.

The point was Southwestern Bell was finally listening to concerns of big users. Now suppose Southwestern Bell parent SBC Communications, Inc. merges with AT&T. Will that help the listening process or hinder it?

So far, reports of the AT&T/SBC merger talks have gone over like a lead balloon with users, despite the potential local and long-distance synergies in SBC states such as Texas and California.

Could it be because users figure that after such a megamerger, Southwestern Bell and Pacific Bell executives would be spending more time listening to the internal rumor mill for signs of the inevitable corporate upheaval than they would spend listening to them?

Wanted: New FCC chairman

Four candidates have emerged to succeed Reed Hundt as chairman of the Federal Communications Commission, and only one of them appears to have the right stuff.

David Rohde

● Current FCC General Counsel William Kennard is credited with improving the FCC's record in beating back court challenges to its rules. But that's only if you look at it on a percentage ba-sis. On all the big issues, the FCC keeps losing in court.

● Former White House Deputy General Counsel Kathleen Wallman has a shot because she once ran the FCC's Common Carrier Bureau. But that's a revolving-door job, hardly adequate training for the rigors of steering the nation's communications policy.

● Private attorney Ralph Everett is being pushed by Sen. Ernest Hollings (D-S.C.) because Everett once served on the staff of the Senate Commerce Committee. But in private practice, Everett currently represents several of the Baby Bells. Now that doesn't seem to be the ticket, does it?

● By contrast, current FCC Commissioner Susan Ness took a different route to the FCC. While almost all the other lawyers who get to the FCC come out of the government or lobbyist law firms, Ness was a senior communications lender for a major regional bank. As a banker, she developed a natural aversion to vendor hype, since borrowers had to prove their technological predictions with dollars.

Ness habitually takes a realistic view of the difficulty of opening up markets and the likely effect of FCC rulings. That would be a refreshing change from Hundt's insufferable self-importance.

It's a tough job, but as usual in Washington, they're lining up at the gates to do it. Ness appears to be the one with the best background to actually make a difference.

Rohde is Network World *Senior Editor of Carriers & ISPs. He can be reached at david_rohde@nww.com.*

Intranet Applications

Covering: Messaging • Groupware • Databases • Multimedia • Electronic Commerce • Security

Briefs

■ **Marc Andreessen,** *senior vice president of technology and cofounder at* **Netscape Communications Corp.,** *has disclosed that the company plans to set up a development center near rival Microsoft Corp.'s headquarters in Redmond, Wash., specifically to attract Microsoft developer talent.*

Andreessen, in an interview with Computerworld Hong Kong, said Netscape has had difficulty attracting Microsoft developers to Silicon Valley, where housing costs are high and traffic can be a nightmare.

■ **3Com Corp.** *has launched the* **Intranet Solutions Center (ISC),** *an online resource and consulting tool for network managers deploying intranets.*

The ISC is organized in three modules: Intranet Advisor, which includes an interactive Q&A and an intranet system design and support guide; Intranet University, a compilation of information from analysts, the press and intranet users; and Intranet Building Blocks, an online directory of intranet product and service vendors.

Users can access the ISC free at www.3Com.com/isc.

■ **IP Multicast** *vendor* **Precept Software, Inc.,** *of Palo Alto, Calif., last week announced software that allows PC users to view broadcasts on the Multicast Backbone (MBone).*

The product, an MBone-specific version of Precept's IP/TV Viewer client software, is being offered to users in the academic and research communities. It features a program guide, video server and viewer. The software can be downloaded from Precept's Web site (www.precept.com) for $39.95.

© Precept: (415) 845-5200

SilverStream makes a splash with Java-based Web applications platform

By Chris Nerney
Burlington, Mass.

David Litwack remembers how hard it was in the late '80s to sell IT shops on his company's client/server development tools.

"It was missionary," said the former president of Powersoft Corp. "We had to convince [companies] that PCs and Windows were appropriate."

This time around, things may be easier for Litwack. He thinks the market is ready for the Java-based Web application platform that his new company, SilverStream Software, Inc., plans to release this fall.

"Executive management loves the Web," said Litwack, Silverstreams's president and CEO.

Nevertheless, SilverStream will be entering a highly competitive market. Large vendors such as Microsoft Corp. and Lotus Development Corp., as well as start-ups such as HAHT Software, Inc. and Wallop Software, Inc., all have Web application development tools.

But Litwack said SilverStream's platform is more comprehensive than those of its competitors because it allows companies to create and run sophisticated Java-based business applications, such as contact tracking, order processing and sales force automation.

"Most of our competitors have point products," he said. "They don't have a whole environment."

The more the merrier

Market analyst Ezra Gottheil at Hurwitz Group in Newton, Mass., called SilverStream's platform "a good, solid, thoughtful design," adding that HAHT's HAHTsite 2.0 also is a comprehensive Web applications platform that relys on Java. Still, Gottheil said, the Web development tool market easily is big enough for many competitors.

SilverStream's platform consists of an application server and an object-oriented designer for building database tables, Web pages and business forms. It includes client- and server-side Java code, relational database technology, an HTML editor and software agents that can push information to desktops.

By storing everything on the database, Litwack said, SilverStream enables users to manage all aspects of the Web site — relational data, Web pages, dynamic content and business logic — within the context of a database on the server.

SilverStream's *Web applications platform allows users to create customized Java-based business applications.*

About 60 companies are testing a beta version of the product, said Litwack, who joined SilverStream in April after leaving his post as executive vice president of Sybase, Inc.'s Powersoft Division. Sybase bought Powersoft in 1994.

SilverStream was founded a year ago by Chairman David Skok, former CEO of imaging software vendor Watermark Software, Inc.

Show me the money

According to Litwack, SilverStream has just finalized a second round of financing, raising $8 million from founders and venture capital firms Matrix Partners and North Bridge Venture Partners.

The company's Group Starter Pack, which includes an object-oriented visual development tool, an application server license and connections for up to 10 users, will cost $5,995. An individual pack will cost $495. Additional designer components can be downloaded free at www.silverstream. com.

✆ SilverStream: (617) 238-5400

Wyse cuts cord for thin client

By John Cox
San Jose, Calif.

"Windows unplugged" might be a better name than "Winterm Wireless 2930" for what seems to be the first wireless Windows terminal.

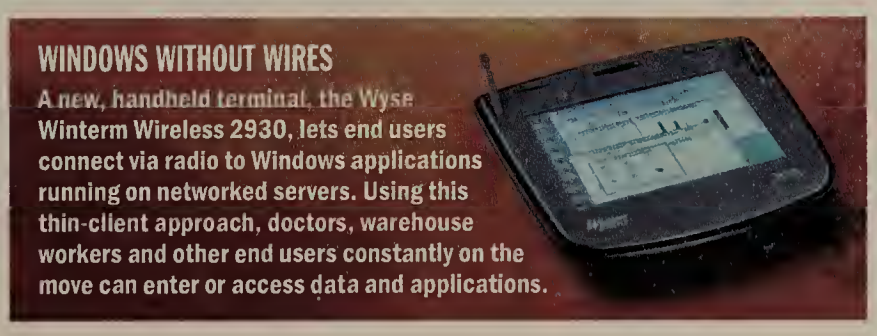
The so-called thin-client device, which is being announced by Wyse Technology, Inc. this week, is linked via radio to a LAN-based server running Windows applications. End users, such as doctors in examining rooms or warehouse inventory control workers, can carry the 3.4-pound, handheld terminal from location to location, with instant access to Windows applications and data.

Right Systems, Inc., a systems integrator in Tumwater, Wash., has built two pilot systems using a beta version of the wireless terminal. "Most people want to know how we can deliver Windows applications to a terminal [instead of a full-blown PC]," said Craig Sanders, a senior systems engineer with the company. "We tell them that everything runs on the server, and you pump out just the graphics displays over the network to the device."

One pilot, for a medical clinic, lets examining doctors access a custom Windows-based diagnostic application from a patient's bedside.

The Winterm 2930 device accesses a LAN via the required Proxim RangeLAN radio link from Proxim, Inc. of Mountain View, Calif. The Proxim radio connects to the LAN via 10Base-T. Inside the terminal is Cruise Technologies, Inc.'s CruiseConnect software, which substitutes for an operating system in wireless devices.

The terminal also uses, as do Wyse's standard PC-based Winterms, client software that interacts with Citrix Systems, Inc.'s WinFrame multiuser version of Windows NT, running on an Intel Corp. server. WinFrame is the required server that hosts Windows applications for the wireless terminal.



It's in the details

The Winterm Wireless 2930, the first in a new family, has the following specifications: an 8.5-inch passive dual-scan color LCD panel with 16 colors, keyboard interface and serial port. The list price is $3,399 per terminal. The WinFrame server and Proxim radio link are sold separately.

Wyse also announced remote administration software for the entire Winterm line. The new software, due out this month, lets administrators manage thousands of Winterms. The software is priced at $1,195 for each site, with up to 75 users per site.

✆ Wyse: (800) 438-9973

PointCast begins hunt for CEO

By Carol Sliwa
Santa Clara, Calif.

Push pioneer PointCast, Inc. last week introduced management tools and an updated client, but the news was overshadowed by the company's acknowledgment that it has begun searching for a new chief executive officer.

Preparing for its anticipated initial public offering (IPO), PointCast is looking to replace 34-year-old company founder Chris Hassett as CEO with a more seasoned executive. Hassett will stay on as chairman.

Conducting the search will be Ramsey/Beirne Associates, Inc.'s David Beirne, who has helped companies such as Netscape Communications Corp. and Novell, Inc. find chief executives.


PointCast founder *Hassett*

Under Hassett's five-year stewardship, PointCast grew to 265 employees and got more than one million Internet users to try its software, which deliver news updates to the desktop when the viewer's screen is idle.

"Chris has done a good job, and we're not making this change to get somebody who's just good. We're getting somebody who's got to be great," said Jonathan Feiber, a member of PointCast's board of directors and a general partner at venture capital firm Mohr Davidow Ventures in Menlo Park, Calif. "The company's really pushing to grow as quickly as it can and to expand."

The move will dovetail with the company's IPO plans, as well. PointCast recently brought in a new chief financial officer, Phil Koen, who led Etec Systems, Inc. through its IPO.

"If it makes sense to do [the IPO] this year, then it could be this year," Feiber said. "We just don't know for certain whether it'll be this year or next."

On the product front

PointCast also announced three new tools — Corporate Broadcast Manager, Caching Manager and Administrator — that will help companies customize and manage the broadcast of internal corporate information and external news via any standard Web server.

With Corporate Broadcast Manager, a company can deliver content from intranet Web servers, corporate databases and Lotus Development Corp.'s Notes applications through a private channel.

The Caching Manager lets administrators manage the external information that is pushed through their corporate firewalls.

And the new Administrator lets network managers configure PointCast installations for their employees as well as control content that is broadcast over their private channel.

The tools, which are free, will be available this summer for beta testing on Windows 95 and Windows NT.

Caching Manager releases for HP-UX and Solaris will follow later this year.

The tool set replaces the existing PointCast I-Server that companies used to broadcast internal news to employees via the PointCast Network. I-Server, which sold for $995, will now be available for free.

The beta of the company's new client, PointCast Network 2.0, also can be downloaded free at www.pointcast.com.

Change the channel

The new and faster 32-bit client supports open Web broadcasting via a new "superchannel" called PointCastConnections, which lets any Web site broadcast its content through the PointCast Network.

The client runs on Windows 95 and NT and features native integration with Microsoft Corp.'s Internet Explorer Web browser.

It also supports Netscape's Navigator browser.

A 16-bit Windows 3.1 edition is due later this month.

The Cupertino, Calif., company also released a beta of a content creation tool, PointCast Studio, that lets companies build animated commercials and customized screens that appear whenever the user's computer is idle.

An Added Control client, also due this summer for beta testing, will let companies screen out advertising. ■

www.nwfusion.com

Get more online: Find it on Fusion 2316

- One consultant's ranking of his five favorite push companies
- A hyperlinked listing of push providers

Prolific gives Java clients access to Web apps

By John Cox
New York

Prolifics is readying a version of its development tool kit that can be used to build Web-based transaction applications accessible via Java-based desktops.

Until now, users could only download HTML pages via Web browsers from servers running applications designed with Prolifics software.

The new release, Prolifics Version 3.0, will be able to detect if an end user's browser supports Java, and if so, download a new Java applet to the browser. The applet will create and maintain links to network applications built with the Prolifics tools. The applet will use services provided by Prolifics software.

The applet also includes code to coordinate changes made to databases through a version of BEA Systems, Inc.'s Tuxedo TP monitor, which is part of the Prolifics server.

JDK support

The Prolifics release will support Version 1.1 of JavaSoft, Inc.'s Java Development Kit (JDK), said Frank Vafier, president of Prolifics, a subsidiary of JYACC, Inc. This JDK features improved graphics handling, enhanced security and the JavaBeans component model.

Also new will be a publish/subscribe agent, which is code that allows transactions started by one client to be passed or pushed to another as part of a workflow.

Prolifics 3.0 will run on SunOS 4.X, Windows NT and Solaris, as well as on other Unix platforms in October. Prolifics will keep the price of its software the same; it starts at $35,000 for a five-developer system.

©Prolifics: (212) 267-7722

Intranet management: One size doesn't fit all

By Ellen Messmer

Web servers have mushroomed across corporate networks during the '90s like LAN servers spread across companies during the '80s.

And just as MIS departments were confronted with whether they should centralize LANs throughout an organization or allow each department to do its own thing, network managers today are trying to determine the best way to manage intranet sprawl.


PRC's *Wilson*

"For a year, we went through that stage where we had Web pages all over the place," said Harold Wilson, vice president and general manager of process engineering at PRC, Inc., a McLean, Va.-based government contractor. "It was a mess."

More than 100 Web servers, with content generated by multiple divisions, sprang up almost overnight across PRC's backbone network. The uncoordinated approach — together with the fact that Web pages fell into neglect when the novelty wore off for Web authors — convinced Wilson and Cora Carmody, PRC's chief information officer and intranet team leader, to put a stop to the Web anarchy.

Wilson said PRC began an effort to create a common look and feel to its pages. "We went to individual managers and said, 'Here's a structure, here's what you can do,' " he said. "We now have six official Web servers, managed on a 24-hour basis, for business-critical applications."

"As part of our culture, we naturally evolve toward a more collaborative environment and more structure," Carmody said. "Why reinvent the wheel on multiple Web servers? We can reuse the design elements so we can focus on Web content creation."

PRC's MIS division organized training sessions to teach administrative staffers how to post material to the corporate Web as part of their jobs. About 40 administration personnel now post Web page updates.

"Human resources at PRC does almost everything on the Web," Wilson said.

Just to ensure that the company's Web environment stays under control, the MIS staff occasionally uses a network sniffer to check for renegade Web sites.

"This is not like the Web gestapo," Wilson emphasized. "It's on a collegial level."

One reason for keeping a close eye on Web server growth is that intranet traffic can have a big impact on network traffic. PRC, which already had T-3 links between offices in the Washington, D.C. area, has added T-1 links for offices in Nebraska, Pennsylvania and Colorado mainly because of the increased volume of Web-related traffic.

Other companies, such as package delivery firm DHL Systems, Inc., are taking a looser approach to intranet management.

"We have not restricted anyone from putting up a Web server," said Vanessa Lea, Internet services manager at DHL, which operates an IP-based network spanning 220 countries. "It's a local management decision. If you have a page, just let us know about it."

DHL maintains a central intranet page that advertises and links to any Web server within the company, though there are a few pages and sites to which access is restricted. One of the most important uses of Web servers at DHL is to let end users download proprietary desktop software the company designed to run its business.

At DHL, the MIS department acts like a consultant when it comes to managing internal Web sites. For instance, it helps departments set up manageable Web sites by recommending development tools that have proven useful, such as NetObjects, Inc.'s Fusion tool kit.

DHL demands uniformity in its public Web servers that advertise the company's delivery and package-tracking services. Duplicate Web sites, one in Burlingame, Calif., and another in London, provide redundancy and load sharing.

With DHL Japan and DHL Australia now eager to set up similar public Web servers, the company's Burlingame office is requiring overseas divisions to toe the line. ■

NET INSIDER

An evil empire returns?

The common enemy of the human race in the movie *The President's Analyst* was an organization known by the initials TPC. This sinister organization was plotting to take control of everyone on earth and implant electronics in all newborn babies. After some plot twists, it turned out that TPC was The Phone Company.

In 1967, when the movie was produced, the idea that those "people" (rent the video to understand the quotes) were trying to take us over had a ring of truth to it, which made the idea even funnier.

Scott Bradner

With the breakup of Ma Bell and competition creeping in for many old government monopoly post, telegraph and telephone administrations, much of this feeling has remained unexpressed in the past few years. But the rhetoric may be starting to reemerge.

The fact that there has been no competition for local phone service in the U.S. yet, in spite of last year's telecommunications reform act, has raised the general level of annoyance. Now some people are starting to hint at global conspiracies again. One example can be found at www.arl.wustl.edu/~jst/TransPrice.html.

The Web site's author, Jonathan Turner, made an assumption that the average cost of fiber (including the fiber itself, right of way and installation) is $1,000 per kilometer. He calculated that carriers are charging between 10 and 100 times their total installation cost per year for fiber-based services such as 155M bit/sec ATM.

The implication is that because all carriers seem to be charging about the same, there must be some sort of conspiracy that can only be corrected by reregulating the telecommunications industry.

On very large fiber installations, such as Qwest Communications Corp.'s planned 13,000-mile network of 96-fiber cables, the cost seems about right. Qwest is spending $1.4 billion to install about 2 million kilometer of fiber or about $700 per kilometer. For most installations, which are far smaller, the costs will be far higher.

In any case, figuring out what the cost of fiber-based service should be from the cost of the fiber is like determining the cost of a college education based on the professor's salary divided by the average number of students in the class. There are one or two other things that should be figured in.

Even if the cost estimate is way off, what about the general allegation that carriers are charging far more than their cost for these services? Turner points out that the fee structure seems to be set by multiplying the fees for low-speed lines by the number of lines that could fit in a high-speed one.

But I think he missed the point that carriers fear wiping out their lower speed services if they sell a few high-speed lines to someone who resells services or to a corporation that currently buys many lower speed lines.

There are many things that factor into the price charged for a service. The cost of fiber is only one small part. Management, maintenance, the cost of money, return on investment and many other things add into it. The return of TPC as evil empire reestablishes a comfortable common enemy, but it oversimplifies a complex problem.

Disclaimer: At Harvard, TPC is the Technology Products Center, the campus computer store, so the above simplification is my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached via the Internet at sob@harvard.edu.

ON Technology stiffens firewall security

By Ellen Messmer
Cambridge, Mass.

ON Technology, Inc. last week announced it has loaded its signature firewall product with new security features, including URL blocking, user authentication and a way to set up extranet policies.

ON Guard Firewall 2.1, a free upgrade for current customers, will enable companies to make inappropriate external Web sites off-limits to employees. The software will allow companies to block specified URLs.

Version 2.1 also is designed to authenticate remote users, such as sales or engineering personnel, through dynamic password protection based on Remote Authentication Dial-In User Service and the Challenge Handshake Authentication Protocol. To take advantage of this feature, remote users have to install the company's new ON Guard User Authentication software, which is available for Windows 95 and Windows NT clients and servers.

To provide secure access to Web servers for trading partners, ON Technology has added support for the 56-bit Data Encryption Standard as well as the IP Security standard, which lets trading partners identify each other through X.509 digital certificates.

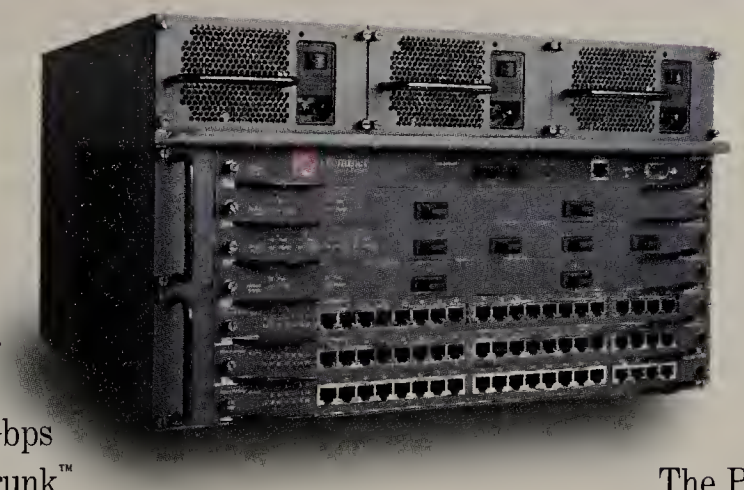
The new functionality in ON Guard Firewall 2.1 will let corporations maintain private and public Web servers directly behind the same firewall, said Phil Neray, ON Technology's director of product marketing.

"The firewall looks at every single packet coming through the firewall, checking where the packet is coming from and where it's allowed to go," Neray said. "The key enhancement here is being able to set up separate security policies."

✆ ON Technology: (617) 374-1400

Hot Stuff.

Introducing Prominet's P550 Cajun Switch



The Prominet P550™ Cajun™ Switch is the highest capacity Gigabit Ethernet switch available. Now campus LAN managers can migrate networks and backbones to gigabit speeds without distress.

A Ragin' Recipe. The P550 Switch has a spicy blend of 41.6 Gbps on the backplane, unique OpenTrunk™ VLAN interoperability, extensive fault tolerance and CoS/QoS support, all in a high-density package. This means more bandwidth, no bottlenecks, better manageability and dependable multimedia support.

Chock Full. At two to three times the capacity of any other gigabit switch (41.6 Gbps backplane, 20.8 Gbps throughput), the P550 fits into 10.5" of rack space while switches with less performance require double or triple the space and cost more.

The Big Easy. Integration of 10/100/1000 Mbps speeds with various modules lets users allocate bandwidth where needed. Six payload slots scale from workgroup to multithousand-node, multimedia-rich campus backbone requirements.

Zesty Multilayer Switching. The P550 is designed for multilayer switching that scales to more than 10 million packets per second. A simple module swap will provide Layer 3 switching for IP and IPX routing.

Hot Stuff. To learn more about the first in a family of hot switching products from Prominet, point your Web browser to: **www.prominet.com/info/.**

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Technology Update

Covering: Evolving Technologies and Standards

NUTTER'S NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to rnutter@world.std.com.

Under a NetWare 4.1 environment, how can I operate someone's computer over the network from another workstation? Also, can I see what that person is doing?

Via the Internet

The answer is "yes" to both questions. The approach depends on how transparent you want the operation.

You could use Reachout Version 7 from Stac, Inc. or PC/Anywhere Version 7.5 from Symantec Corp. These products allow you to take control of a workstation from anywhere on your network or, if you have the appropriate type of connection, via the Internet.

However, there's a catch. For you to take control remotely, the computer you want to take control of must be running the same software you're running on your computer. If you have a lot of workstations you want to remotely monitor or control, you'll have an extensive rollout.

Novell, Inc. offers a potentially easier solution in ManageWise. This package allows you point-and-click access to take control of a workstation, potentially without the user's knowledge. This choice also prevents users from changing their configurations in a way that would prevent your ability to take control.

With ManageWise, you also can get information, such as the version of the client software loaded at the workstation and the drives mapped, without actually taking control of the workstation.

Compaq Computer Corp.'s unique approach operates via extensions to its Insight Manager program that allow workstations to report problems to the server. This approach provides a way for you to be proactive.

Stac and Symantec offer download trial versions (www.stac.com and www.symantec.com, respectively). You also should be able to obtain an evaluation version of ManageWise from Novell or your local Novell reseller.

Using policy-based QoS to better manage Ethernet bandwidth

QoS capabilities allow network managers to control the ebb and flow of network traffic.

By George Prodan

Until recently, the ability to manage network resources and control bandwidth allocation and traffic prioritization on Ethernet networks has been something network managers could only dream about. But with policy-based quality of service (QoS), the dream becomes reality.

Policy-based QoS allows a network manager to allocate bandwidth and prioritize traffic within the network based on a set of administrative policies and usage patterns. This ability to control the ebb and flow is now more important than ever: Network traffic is at an all-time high because of the influx of Web-based data and video streams crossing the corporate backbone.

Consider, for example, a manufacturing company that has good network performance during normal, day-to-day operations. But during the crunch of end-of-month shipping and billing processes, the network slows to a crawl and other company functions are put on hold to recover the required bandwidth.

With policy-based QoS, bandwidth can be allocated evenly across all departments for the first three weeks of the month, then preset to favor the accounting and shipping departments during the last week. Traffic originating from the manufacturing subnet can be given priority, while ensuring that all other traffic continues to get through, even if at a lower performance level.

What's good for ATM . . .

Long considered one of the more compelling benefits of ATM, this level of control is new to Ethernet networks. Gigabit Ethernet provides the speed and bandwidth needed for QoS, and policy-based QoS software provides the prioritization and bandwidth allocation schemes to complete its delivery to the Ethernet network.

Building on emerging standards, including the IETF's Resource Reservation Protocol (RSVP) and IEEE 802.1p and 802.1q, policy-based QoS is a high-level capability that adds detailed traffic grouping, assignment of QoS profiles and mapping to queues associated with specific switch or router ports.

This higher level capability means added control for the network manager. RSVP alone, for example, provides explicit QoS. Explicit QoS is endstation initiated and gives the power to request bandwidth to the individual user. Left unchecked, RSVP-enabled endstations can usurp bandwidth and starve other — possibly more critical — applications.

Implicit QoS is policy based; it returns control to the network manager. Policies are set centrally based on the network's unique traffic patterns.

QoS traffic groups

Policy-based QoS consists of the identification of a traffic group plus the QoS profile for that group. The more flexibility the network manager has when assigning policies, the greater control is gained over the health of the network. Traffic groups can be based on topology or groups of users, individual station or application session using several variables (see graphic).

These traffic groups are mapped onto multiple queues associated with a policy-based, QoS-enabled switch. For each queue, the QoS profile can include minimum bandwidth, maximum bandwidth, peak bandwidth, relative priority and maximum delay.

Depending on the unique needs of the network, the network manager may choose to set all of these variables or use a subset. Or perhaps only one or two traffic groups need QoS profiles assigned — all other traffic on the network would then fall into "best effort," as if no QoS scheme were employed.

Setting minimum and maximum bandwidth will guarantee average bandwidth to a particular traffic group over time. Although short bursts of data may actually exceed the maximum, the system will contain bursts to an average over time. Setting a limit on peak bandwidth will permit the bursts of data to bring the connection up to average bandwidth more quickly.

When multiple traffic groups are assigned QoS profiles, bandwidth is allocated equitably across all queues. All things being equal — that is, when the total of all minimum levels of bandwidth assigned do not exceed 100% — each queue is guaranteed its minimum bandwidth.

The tiebreaker

Relative priority policies will break the tie when bandwidth allocated by the policy exceeds what is actually available. This is called weighted fair queuing. Bandwidth is shared equitably so that while high-priority traffic is sent first, low-priority traffic is not forgotten and gets through within an acceptable minimum performance range.

For delay-sensitive traffic, including that generated by applications using an admission control mechanism such as RSVP, a maximum delay setting will ensure timely delivery. This is critical for video and multimedia traffic.

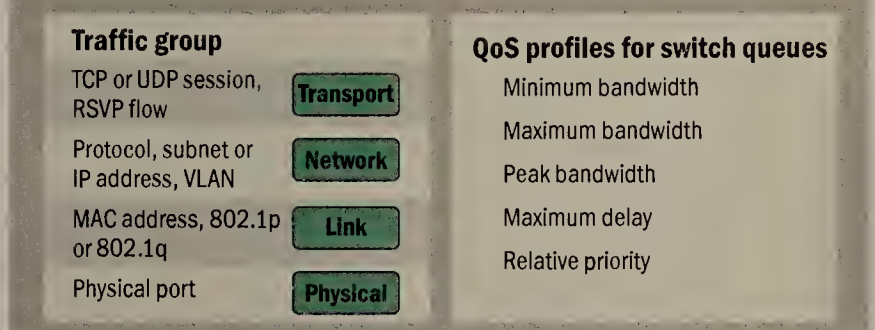
Because policy-based QoS is implemented through virtual queues on the enabled switch, networkwide QoS can be achieved without altering endstations. This represents a breakthrough in the ability to manage and control the increasing diversity of traffic found in today's LANs.

Prodan is vice president of marketing at Extreme Networks, a Layer 2 and 3 Gigabit Ethernet switch maker in Cupertino, Calif. He can be reached via the Internet at gprodan@extremenetworks.com.

UP CLOSE

Mix-and-match QoS policy

To create a policy-based QoS, a network manager would match a traffic group to a switch queue with a particular QoS profile. As shown below, traffic groups can be based on topology or groups of users, individual station or application session. These traffic groups are mapped onto multiple queues associated with a policy-based, QoS-enabled switch.



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EDITORIAL *insights*

Netscape and the 'A' word

A decision Netscape CEO Jim Barksdale made a couple years ago may well save the company. It wasn't when the outfit decided to get into e-mail and groupware, and it wasn't when they decided to develop push.

No. It was when Barksdale realized that many were using the 'A' word to describe his company. Like Barney Fife, Barksdale decided to "Nip it. Nip it in the bud!"

The 'A' word is not the one you may be thinking of, but it's close. 'A' stands for arrogant.

Being a type A company is fine if you have the power. Some chumps like Dennis Rodman can get away with it because they have a lot of talent. They are unstoppable.

Netscape was not and is not that secure. More than anything, Netscape needs solid partners. After all, Netscape is going up against big, bad Microsoft and can use all the help it can get — either to help it on the way up or cushion the fall on the way down. Just look at Lotus. It was arrogant for a while, but a solid drubbing by Microsoft changed its tune pretty fast.

Shortly after Netscape went public, Barksdale started hearing the 'A' word more and more. "Everyone wanted a piece of us," Barksdale told me after a recent press briefing. According to a half-serious Barksdale, everyone — even the toilet bowl maker — wanted a "strategic partnership," and when he said no, they called him arrogant. "That hurt," Barksdale confided.

He also realized it could hurt the company, so he vowed to turn its image around. His biggest tool is a quarterly survey to measure Netscape's image, a trick Barksdale learned at FedEx. The result has been generally good.

Not perfect, though. We still hear plenty of grumbling and name-calling, just not as much. It seems the biggest problem is still handling growth and the demands of would-be partners. One partner simply looking to update a deal told me he can't get his calls returned. "They are not intrinsically jerks. They are just growing too fast." The result, though, is the same. "They are not treating their family very well," the partner said.

But even this is a far cry from what we were hearing six or 12 months ago, when nearly everyone had a bone to pick with the browser boys. It wasn't just that Netscape didn't have time for people, they seemed to act like they didn't need them. Instant celebrity will do that. All it takes is a bad movie or two (or a falling stock price) to bring you back to earth, and thankfully that is happening to Netscape.

So is Netscape arrogant? That's not for me to say. But if they are, it is less than before.

Doug Barney, news editor *dbarney@nww.com*

On Security • Winn Schwartau

Secure nets require a little humility and a lot of foresight

A client recently hired my company to do a security analysis of some mission-critical systems they were installing. Happy to get the contract, we prepared our "Tiger Teams" to penetrate each of the associated systems, not thinking twice about any political problems.

Sure, some firms, especially large ones, get a little antsy when they hire Tiger Teams to emulate, simulate and actually launch benign attacks against their very infrastructure. But out of necessity, they get over it and we proceed, poking and prodding into the virtual nooks and crannies of their electronic shells. It's all done in the name of good security practices.

But this time, something went wrong. Our contract lead, whom we'll call Bob, called to say that his associate, whom we'll call Jim, didn't want us to try to break into his RSS networks. (RSS stands for Really Secure System, a sassy algorithm.)

"Why not?" I asked. "That's what you hired us to do."

"Jim says they're secure," Bob chortled. "That's why he calls them RSS."

"But how do you know they're secure?" I countered.

"Jim convinced the boss that since he designed and implemented them, they must be secure and therefore don't need your penetration testing," Bob replied.

I sort of laughed, partly in sadness, partly in pity.

What was wrong here?

Let's assume for a moment that Jim is the world's best systems designer, coder and integrator all rolled up into a single silicon genius.

If he's that darn smart, he should know better than anyone that a double check of his work is the best way to maintain his 1.000 batting average for building impeccable networks.

Instead, Jim seems to suffer from terminal arrogance. He's basically saying, "I am so smart that no one needs to check my work, even if the sanctity and security of my organization is at stake."

If I may be so bold (and arrogant?), I'd like to offer a shortlist of things to keep in mind when it comes to security management.

• Project managers are responsible for the results of the total project, its budget and performance. They should hire people who know their specialties better than they do.

• Project managers are not God — even if they believe they are and tell you so.

• Each of us has expertise that others lack. Security design, implementation and integration are specialties, too. Just because you know C++ really well doesn't mean you can speak fluent crypto.

• Design the security into the project from the beginning. It's a whole lot cheaper than bringing in folks like me later on to fix your mistakes. We charge less for helping you do it right the first time.

• Security is integral to any quality information technology environment today. Act accordingly. Don't pretend.

• Project management is about making all of the pieces work together. Security is a piece.

• You beta-test your applications before deployment. Do the same thing with security for mission-critical and cost-sensitive environments.

• If your project manager tells you the security is perfect and doesn't need testing, refer to the second item in this list.

• Test the system thoroughly using people who have expertise and who do not have an internal corporate political agenda.

There is no magic here — just some common sense, a mild dose of humility and the acceptance that maybe, just maybe, you might overlook one tiny detail, misconfigure a device or make a mistake. Just maybe.

That alone is worth the peace of mind of a Security Sanity Check.

Schwartau is chief operations officer at The Security Experts, a security consulting firm, and president of Infowar.Com. He can be reached via the Internet at winn@infowar.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

Don't forget Xylan

I read with interest your article "3Co primes policy management for VLANs" (May 5, page 42). It's good to see the older companies in our industry validating what customers tell us every day — that virtual LANs without policy manage ment are almost useless.

Unfortunately, while your article me tions that Cabletron Systems, Inc. provides policy-based VLANs and Cisco Systems, Inc. plans to do so, it fails to not that for over a year, Xylan Corp. has beer shipping policy-based VLANs based on physical port, media access control address, protocol type, IP subnet, IPX network number, multicast address or

Push those viruses out of your way

When push comes to shove, McAfee is making it easier for you to keep up-to-date with information and software designed to prevent and fight virus attacks.

In February, the company launched Enterprise SecureCast, one of the first corporate electronic software distribution services to use Internet push technology. Finally, an idea whose time has come.

Preventing and fighting viruses is not a glamorous assignment. Unfortunately, however, it's an important aspect of any diligent network administrator's job.

And just installing software on the network's servers and connected desktops isn't good enough — this software has to be updated pretty regularly. What's more, you need to keep apprised of new threats and even hoaxes.

In the past, you would have to surf the 'Net, search a bulletin board system, or wade through floppy disks or CD-ROMs to find antivirus software updates and upgrades for the corporate network. This new push methodology simply delivers the timely updates you need right to your desktop.

Using technology from BackWeb Technologies, Inc., the SecureCast service establishes a broadcast channel for delivering McAfee's VirusScan software, virus signature updates, enterprise-enabled installation scripts, Virus Information Library updates, news alerts and more.

The antivirus software market is the ideal place for automatic software distribution via the Internet. With more than 200 new viruses discovered each month, timely distribution of updates and news alerts can save you countless hours of agony and thousands of dollars battling a virus invasion.

Critics of Internet push technology claim it will make a network manager's job tougher as users begin receiving all kinds of broadcasts from the World Wide Web. But, unlike other broadcast applications that are directed at end users, Enterprise SecureCast downloads software applications and updates only to authorized people, presumably a company's network administrator.

To receive applications, the subscriber must have a valid grant number, which is assigned when his or her company signs a license agreement with McAfee to purchase the VirusScan software.

To initiate the SecureCast service, you first go through McAfee's online registration process. This downloads the BackWeb client software — that is, the tuner — to your PC, designating SecureCast as a channel on the PC.

Then you select the kinds of updates you want from McAfee, including specifying which types and variations of McAfee software your company uses. For example, there is no need to download Macintosh client software if your company has no Macintosh computers.

From that point on, everything is automatic. As updates and alerts become available, a software agent ships them to your PC any time it is connected to the Internet. An icon appears on your screen to tell you what was delivered. No manual intervention is required to receive the software updates.

Once a software update is downloaded to your PC, you can decide whether, and how, to distribute it to users. This is where push technology on a company's intranet will have great benefit. A service similar to SecureCast would be ideal to distribute software internally to the masses. Rest assured, this point is not lost on BackWeb and its competitors.

If you are already a subscriber to McAfee's antivirus software or to the company's Security Management Enterprise Support Plan, you are eligible to subscribe to the free SecureCast service.

If you don't meet those criteria but your interest is piqued, get more information about SecureCast at www.mcafee.com/securecast/esc or contact McAfee at (408) 988-3832.

McAfee offers a Web-based test drive that will allow you to evaluate this time-saving service. I recommend that any company under a virus threat — and that's virtually every company with a computer — check it out.

At this writing, Enterprise SecureCast supports the distribution of software updates and alerts for McAfee's antivirus software, VirusScan. This summer, McAfee will begin using SecureCast to distribute some of its other products, including its network security and management tools.

Clearly, this is the future of software distribution. You will get software directly from the manufacturer and place it on your own intranet, where it will be pushed out to users' desktops.

Netscape Communications Corp. and Microsoft Corp. plan to embed tuner software in their respective browsers, allowing end users to receive information and software broadcasts directly.

The flood is coming. It is time to start thinking how it will impact your routines and procedures and how you might configure end users' PCs to allow them to receive the right information at the right time. If you need a little push to get started, give McAfee's test drive a try.

Musthaler is vice president of research at Currid & Company, a Houston-based information technology consulting firm. She can be reached at (713) 789-5995 or via the Internet at linda@currid.com.

custom VLAN definition. The VLAN capabilities and management are identical across Xylan's entire range of switches, since all were built rather than acquired.
Douglas Hill
Vice president, corporate communications
Xylan Corp.
Calabasas, Calif.

Java hooey

Regarding your editorial "The Java hooey patrol" (May 12, page 40):

Well said! While Java is pretty cool, true 100% portability comes at the expense of doing anything significant or being able to leverage operating system-specific features.

I believe 100% portability is a myth anyway. There are almost always tweaks or platform-specific compromises needed when crossing platforms. Being all things to all people is like being the proverbial Swiss Army knife: good in a pinch for small jobs but not the tool you'd use for a serious task.

If the anti-Microsoft crowd devoted as much energy to product development and enhancement as they do to attacking Microsoft, their products might do the job for them. Some time ago, Bill Gates bet the farm on Windows and won. Get over it!
Scott Turnamian
Greensboro, N.C.

I agree with much of your editorial on Java hooey. However, I choked when I read your last sentence attributing the hooey in part to "a desperate desire by the non-Microsoft camp to be relevant." Oh, please!

Tell me, where would Microsoft be without the non-Microsoft camp doing their innovations? Who would Microsoft copy or buy?

The non-Microsoft camp is relevant, and I for one hope that the worshipers at the United Church of Microsoft don't get their way. Otherwise, we can just kiss the innovations goodbye.
Cassius Smith
Huntsville, Ala.

Not-so-new service

Your article on roaming access to the Internet ("Water's fine for surfin' overseas," May 26, page 8) describes services that just now are allowing users who travel overseas to have dial-up access to the Internet without having to make long-distance telephone calls.

What the article doesn't mention is that worldwide roaming access has been available for many years from CompuServe. When I went to Switzerland three years ago, I could dial a local CompuServe number there and check e-mail and anything else that required IP connectivity, all via a PPP connection and my regular WinSock TCP stack. And the cost was low compared to a long-distance call to the U.S.
Carl Oppedahl
Partner
Oppedahl & Larson

Teletoons

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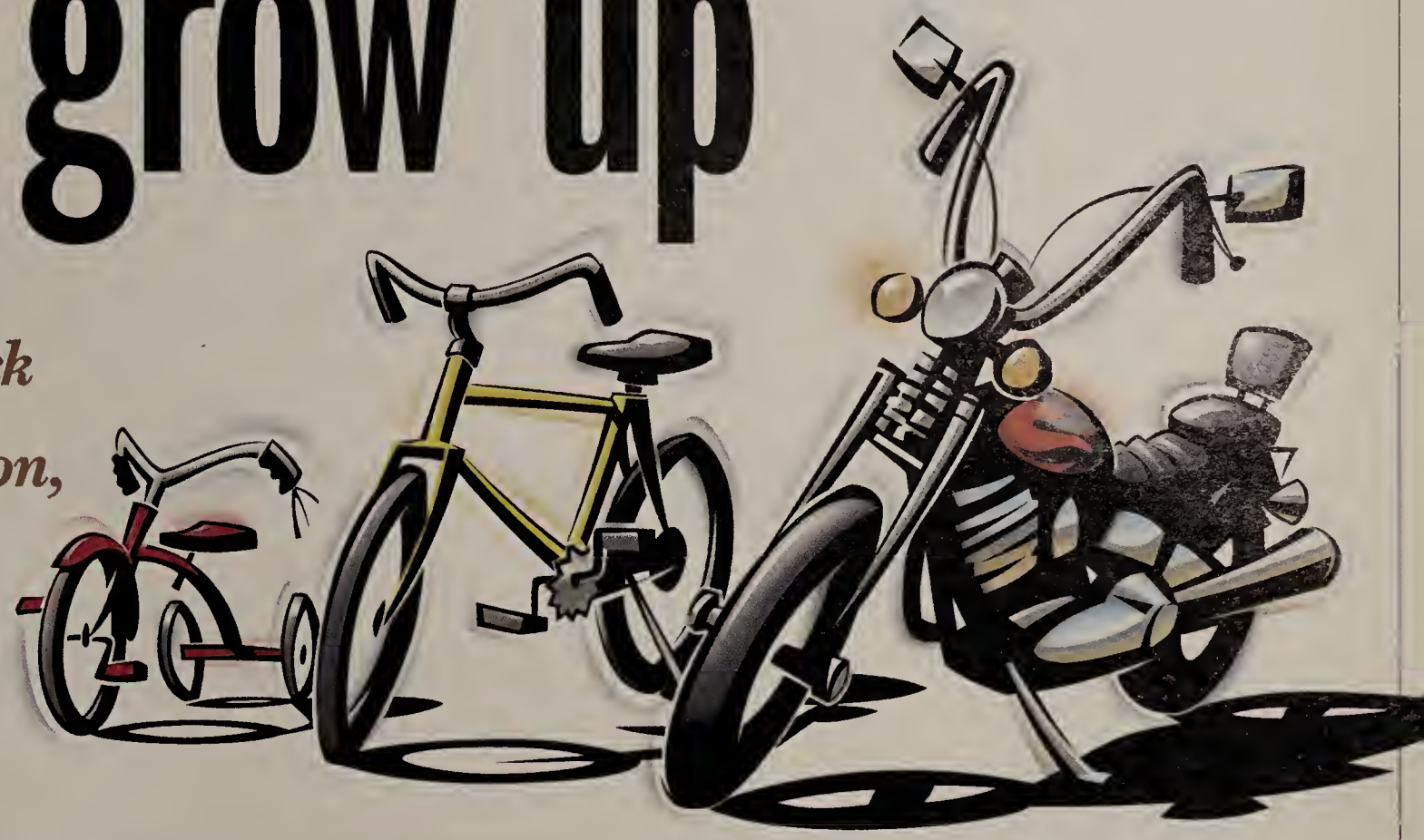
Hubs grow up



Cabletron's the pick of the new generation, rich in features and performance

By Edwin E. Mier, Robert J. Smithers Jr. and Thomas R. Scavo

Yesterday's hubs are toys compared to today's souped-up hardware. Specialized, high-end, multislot switching hubs have grown in features and capacity, sporting capabilities you could only dream of five years ago. This crop of hubs gives you lots of flexibility and centralized control while interconnecting all manner of switched links.

For the review portion of this Buyer's Guide, we looked at systems that provide at least 1G bit/sec of switching capacity, support any-to-any switching between at least two high-speed switching technologies — 100Base-T, FDDI or ATM — and can handle at least eight 100M bit/sec switched LAN segments.

Cabletron Systems, Inc.'s MMAC-Plus chassis with SmartSwitch modules proved to be an exceptionally versatile system with some impressive and useful advanced features, such as those for switch-to-switch link redundancy and load sharing. And based on the moderate-to-heavy test traffic loads we delivered, we found it's an exceptional performer, too. It captured our Blue Ribbon for this test.

Cisco Systems, Inc.'s Catalyst 5000 is oriented to Ethernet and Fast Ethernet switching. We found some limitations with the switching module it offers for FDDI, and ATM wasn't provided by the vendor for this test. But for managing it all, the other two hubs couldn't match the functionality and intuitiveness of the CiscoView management application.

Digital Equipment Corp.'s MultiSwitch 900, which we tested with a variety of the vendor's new VNswitch modules, handles moderate loads of LAN traffic well and provides easy, out-of-the box switching between Ethernet, Fast Ethernet, FDDI and ATM. However, we found that the system misfired under high-traffic loads. All in all, Digital made a good showing, but the competition was better.

We invited Bay Networks, Inc. to show off its latest System 5000 switching hub. Bay declined. So did 3Com Corp., which claims to offer a couple of different systems that would seem to fit the bill. Some other vendors couldn't satisfy all the requirements or indicated their latest switching hub wares weren't quite ready for testing. FORE Systems, Inc. and Xylan Corp. both declined. IBM was also invited but never contacted us.

Cabletron Systems, Inc.
MMAC-PLUS WITH SMARTSWITCH

Pros

- ▲ High throughput; top performer for mix of 100Base-T, FDDI and ATM backbone links
- ▲ Nice graphical interface for VLAN configuration and management
- ▲ Supports redundant, load-sharing, autofailover 100Base-T links between vendor's MMAC-Plus hubs

Cons

- ▼ Spectrum, the main chassis management application, is difficult to use, tedious and nonintuitive
- ▼ High priced

Cabletron: MMAC-Plus is a winner

The MMAC-Plus comes in six- and 14-slot versions; we had one of each for testing. The six-slot unit was configured with two 10/100Base-T switching modules as well as an FDDI and an ATM module. It has a list price of $87,000. We were able to set up the system and switch high-speed traffic streams between diverse technologies in short order.

The system has a number of internal backplane buses that collectively yield a lot of bandwidth and a high degree of configuration flexibility. For example, there's a 200M bit/sec, dual-FDDI internal bus that handles repeater-hub, token-ring multistation access unit (MAU) and concentrator-type modules. Then there's a 72-bit internal parallel bus — 64 bits of which are used for data and eight for access and control overhead — to which the switching modules interconnect. There's even a separate 10M bit/sec bus that can be used exclusively to carry all management traffic for sites with dedicated management nets. Indeed, it's completely up to the user whether management traffic goes in-band — that is, along with user data — or via this out-of-band channel, which assures reliable management access in the event of network problems or hardware outages.

The 64-bit switching bus, which operates at a 40-MHz clock speed and uses an efficient time-division multiplexing (TDM) access scheme, yields an impressive 2.5G bit/sec of switching bandwidth.

Cabletron offers some 70 different modules for the MMAC-Plus, which run the gamut from token-ring MAU cards to ATM 155M bit/sec links. Density is also impressive. You really can pack the system with switched network links — more than 500 switched 10Base-T links can be configured in the 14-slot MMAC-Plus (via 36-port modules) or 168 switched 10/100

BUYER'S GUIDE LINEUP

Scorecard: Page 54

Complete product chart: Pages 56 - 57

SCORECARD AT A GLANCE

Cabletron **MMAC-Plus with SmartSwitch**	8.5
Cisco **Catalyst 5000**	7.5
Digital Equipment Corp. **MultiSwitch 900 with VNswitch**	6.8

ILLUSTRATION BY ELLIOTT PARK

When a company is synonymous with the Web, it needs servers that are synonymous with unstoppable. Which explains why **Netscape™ Communications** chooses 64-bit DIGITAL AlphaServer™ systems to help handle the 135 *million* hits its Web site receives daily. Ultra-reliable AlphaServers are also Netscape's primary backup The Webmaster's Prayer system–because netscape.com simply can't afford to be down. Sheer  muscle isn't the whole story, though.

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Marc Andreessen
Uber-Webmaster
Netscape Communications

Table 1: SWITCHING HUBS — CONFIGURATION LOWDOWN

Vendor	Cabletron	Cisco	Digital
Product	MMAC-Plus	Catalyst 5000	MultiSwitch 900
Slots	6 or 14	5	8
Max. switched Ethernet ports	216 (6-slot) or 504 (14-slot)	96	192
Max. 100Base-T ports	72 (6-slot) or 168 (14-slot)	48	16
Max. FDDI ports	18 (6-slot) or 42 (14-slot)	4	8
Max. ATM-155 ports	12 (6-slot) or 28 (14-slot)	4	8

links (see graphic).

In our maximum load test, we delivered four concurrent 100M bit/sec traffic streams. The packets of each stream were switched to four destination ports on a round-robin basis in rapid succession: a packet stream delivered at wire speed on a Fast Ethernet interface was broken down and switched by the MMAC-Plus to an FDDI, an ATM and two Fast Ethernet output ports.

The MMAC-Plus' any-to-any switching and throughput performance was the best of the three systems we tested. We were impressed: 400M bit/sec of traffic load being switched at wire speed between Fast Ethernet FDDI and ATM links and not a single packet was lost or misdirected.

All data is sent over the MMAC's switching bus in the packet structure native to token ring and FDDI. So while packets to or from Ethernet or Fast Ethernet have to be converted, data to or from FDDI or token rings does not.

We were impressed by the wealth of options for interconnecting switches. Some of these rely on the vendor's proprietary SecureFast architecture, which embodies Cabletron's virtual LAN capabilities.

One of the SecureFast options we tested was the ability to run multiple, parallel 100M bit/sec Fast Ethernet links between two switches, in which all the links share the load and provide hot-standby redundancy for each other. Such capabilities are not inherently supported by standard Fast Ethernet, which many consider a drawback to 100Base-T technology.

We configured three parallel Fast Ethernet links between two switches and delivered a 60M bit/sec traffic load over each one. Then we physically disconnected one of the links to see what would happen. It took just slightly longer than one second, but the complete 60M bit/sec load of the disabled link was automatically shifted to the remaining two links. Total traffic lost during the switchover: about 100,000 packets. Still, given this volume of load and the reliability of the switchover, this unique capability of Cabletron's works well.

Another welcome feature we tested, also part of the SecureFast architecture, is the switch's ability to resolve IP addresses between nodes on different VLANs and selectively allow them to exchange traffic as a router would. With this feature, broadcast traffic still does not pass between VLANs, but point-to-point IP conversations, such as Web-based intranet sessions or File Transfer Protocol file transfers, can occur between nodes on different VLANs — and *without* requiring a separate router.

Otherwise, Cabletron's VLANs are based mainly on individual nodes' media access control addresses. This is a level of sophistication above Cisco's and Digital's VLANs, both of which are based solely on lower level port groupings.

What are Cabletron's weaknesses? Well, we weren't too crazy about the vendor's suite of management offerings. For basic chassis and module management, we had Cabletron's Unix-based Spectrum. We found this software to be complex and far from intuitive to use. While the full-blown Spectrum on Unix is more substantial than the Windows management applications from Digital and Cisco we used in this test, Spectrum is appropriate for managing large networks with a lot of Cabletron equipment.

Cisco's equivalent application, CiscoView, was by far the best of the three tested for this aspect of management.

We also examined Cabletron's new VLAN Manager application Version 1.5, which runs as an add-on with Spectrum. Fortunately, it has its own intuitive graphical user interface. Given the current VLAN management wares from Cisco and Digital, we consider Cabletron's the best VLAN management application.

For traffic monitoring, Cabletron included its new Remote Monitoring (RMON)-based application, which we found rough around the edges. Unlike Spectrum, though, we were able to obtain accurate and understandable, real-time traffic reports via this separate RMON application. Still, the RMON package leaves a lot to be desired as far as usability. Digital's RMON Manager Version 3.3 was the best of the three traffic monitoring applications we examined.

Cisco Systems, Inc.
CATALYST 5000

Pros

- ▲ Best suited for Ethernet and Fast Ethernet environments (high density, best performance for this combination)
- ▲ Best chassis management

Cons

- ▼ Switching throughput between Fast Ethernet and FDDI limited
- ▼ Switching engine module required; takes up 1 of 5 available slots

Catalyst 5000: Ethernet leader

With only five slots, you'd expect the port density of Cisco's Catalyst 5000 wouldn't match that of Cabletron's six- or 14-slot MMAC-Plus, or Digital's eight-slot MultiSwitch 900. It turns out, though, that the Cisco box can still handle a fairly hefty load — up to 96 switched Ethernet ports or 48 switched 10/100Base-T ports.

The Catalyst 5000 configuration we tested goes for $42,000, including the switching engine module, two 10/100Base-T switching modules and an FDDI switching module. If an ATM module were included — making the configuration comparable with those of Cabletron and Digital — it would have bumped the list price up by $10,000, to a total of $52,000.

The Catalyst 5000's top slot requires one of Cisco's switching engine modules, leaving only four slots for other modules. This highlights the fact that switching is more centralized with the Catalyst, while it is more distributed to individual switch modules in the Cabletron and Digital architectures. The switching engine module in the Catalyst 5000 can also be viewed as a single point of failure.

Switching in the Catalyst 5000's top slot uses a 48-bit-wide bus that operates at 25 MHz, yielding a "gross" system switching bandwidth of 1.2G bit/sec. But unlike the TDM-based access mechanism of Cabletron's MMAC-Plus, Cisco uses an arbitration access scheme, which tends to involve more overhead. Still, according to Cisco, about 1G bit/sec of "net" system switching bandwidth is available for user data across the backplane of the Catalyst 5000.

While Cisco now ships an ATM uplink module for the Catalyst 5000 switch, it didn't include one with the model we tested. Cisco's ATM module cannot be used to directly interconnect Catalyst switches; all ATM connections must go through an external ATM switch. Cabletron and Digital support direct connection of their respective switches via ATM.

Cisco does offer a broad assortment of modules for the Catalyst 5000, including various Ethernet and 100Base-T hub modules (as opposed to per-port switching modules). However, certain technologies, such as token ring, are not supported.

The Catalyst 5000 is clearly oriented toward Ethernet and Fast Ethernet switching. All traffic is moved across the system's switching bus in Ethernet packet format. This means there's no reformatting or conversion required for packets coming from or going to Ethernet or Fast Ethernet ports, but translation is needed for data switched to or from FDDI or ATM.

Our performance tests showed that the Catalyst 5000 could handle most, but not all, of the heaviest traffic loads we delivered. With four 100M bit/sec packet streams, delivered via 100Base-T ports and switched on a round-robin basis to FDDI and other 100Base-T ports, we noted packet loss between 8% and 10%.

Most of this loss, however, occurred with traffic being switched between 100Base-T and FDDI. Cisco acknowledges that its current FDDI switching module for the Catalyst 5000 can handle no more than about 100,000 packet/sec. Each of the high-volume test traffic streams we delivered via Fast Ethernet ports applied a traffic load of nearly 150,000 packet/sec, so we were overloading the FDDI switch module by about 50,000 packet/sec.

We observed that throughput for the Catalyst 5000 was best for traffic switched between Ethernet and Fast Ethernet ports, as expected, because no conversion of packet format is needed in that case. Indeed, when we switched a couple of 100M bit/sec traffic streams between just Fast Ethernet ports without any FDDI in the picture, there was no packet loss.

As noted, we regard Cisco's CiscoView application as the best of the three vendors' packages we examined for hub chassis and modules management. Cisco's new VLAN Director software Version 1.3 is a bit complex and takes some getting used to. For configuring VLANs across Catalyst 5000s, we preferred to use the more basic VLAN components of CiscoView rather than the VLAN Director application.

For traffic monitoring, Cisco's suite, collectively called CiscoWorks for Switched Internetworks, now also includes Traffic Director. This is a version of Frontier Software Development, Inc.'s RMON application, which Cisco adopted. This software, like VLAN

ScoreCard

	MMAC-Plus	Catalyst 5000	MultiSwitch 900
Overall score	8.5	7.5	6.8
Installation and configuration (25%)	8	7	6
Features and functionality (25%)	8	6	7
Management and administration (25%)	8	9	8
Performance (25%)	10	8	6

Scores based on a scale of 1-10. Percentages are the weight given each category in determining overall score.

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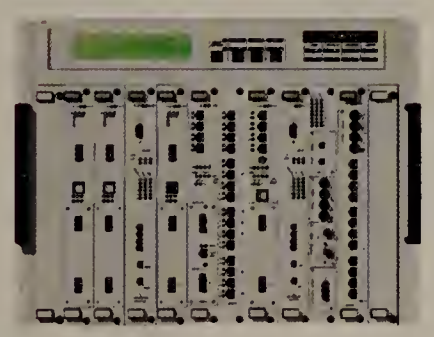

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Switching rises to the top of the hub buyer's checklist

By Paul Desmond

Ask the experts what is the most important thing to look for in a high-end hub, and most likely they will say it is switching.

Switching is where it's at, even if you're talking hubs. Shared bandwidth just doesn't cut it anymore. Fortun-ately, all the products listed in the Buyer's Guide chart at right do indeed support switching, albeit to varying degrees.

Esmerelda Silva, an analyst at International Data Corp. in Framingham, Mass., says to look for a product that supports Layer 3 switching, which means it will handle some form of IP switching or routing protocols such as Routing Information Pro-tocol and Open Shortest Path First. This will help you segment your networks to avoid the broadcast storms and other pro-blems associated with bridged networks. With the exception of hubs from Allied Telesyn International Corp. and Optical Data Systems, Inc. and the Centillion 100 from Bay Networks, Inc., all the products on the chart support some type of Layer 3 switching.

Switching capacity is also key. What you need to pay attention to is the aggregate nonblocking capacity, which refers to the amount of bandwidth you can pour into a switch without having any of it choked off.

There's no magic number to look for here, according to Glenn Gabriel Ben-Yosef, president of the Boston consultancy Clear Thinking Research, Inc. You simply have to add up how much bandwidth will be feeding into the hub and make sure you pick a hub with the backplane capacity to handle it.

That's not to say you shouldn't think ahead and try to anticipate future requirements. For example, if you expect to use Gigabit Ethernet in the near future, you'll likely want to check out products from vendors such as Cabletron Systems, Inc., NBase Communications, Inc. and 3Com Corp. As the chart shows, all of these vendors offer hubs with at least 10G bit/sec capacity.

If you're not sure what your requirements will be, Ben-Yosef recommends staying away from these high-end behemoths and sticking with a stackable hub or switch. "High-end hubs are still suitable for large companies that have pretty much a static number of users, like if you've got a floor of 100 traders," he says. But if your business is more volatile, he says it's easier to grow or shrink your net as necessary using stackables.

As with switching, all the hubs listed in the chart support virtual LANs, although it's a mixed bag in terms of the exact type and extent of support offered. Most support VLAN groupings based on port, but beyond that, things vary. Only four vendors — Cabletron, IBM, NBase and Xylan Corp. — support all the options, including the ability to configure VLANs based on your choice of IP address, media access control address and port and having VLANs span switch modules and hubs. The rest offer only a subset of those configuration options.

Even though many users aren't yet taking full advantage of VLANs, in part because multivendor standards are still being hashed out, it's an important feature to keep in mind. "People will want to take advantage of the capabilities of VLANs as they redesign their business processes and require technologies that make grouping much more effective," Ben-Yosef says.

In terms of network management, there are a few basics to look for. SNMP is pretty much a given, although only about half the vendors support the newer SNMP Version 2. All the contenders offer Remote Monitoring in at least some of their hub models, and Silva says it's a must in a high-end box.

You'll also find some variation in terms of whether vendors require a separate management module, thus chewing up a valuable hub slot, or if management processors are loaded onto each hub module. All of the high-end hubs can be managed from popular management platforms, including Hewlett-Packard Co.'s OpenView and SunSoft, Inc.'s SunNet Manager.

As for pricing, let's just say these things aren't cheap. "It's still in the $600-per-port range for a high-end switching solution," Silva says. She expects the price to drop below the $400-per-port mark by year-end.

Keep in mind that these high-end units are highly fault-tolerant, flexible, scalable devices intended for duty in the core of the network. For that reason, Silva says it's not fair to compare them in price to something like Bay's BayStack 350 line, which comprises low-density wiring closet units priced from $250 to $300 per port. ■

HIGH-END CHASSIS-BASED SWITCHING HUBS

Company	Product	No. of slots	Aggregate capacity	Maximum number of LAN types per backplane					
			Bit/sec	10M bit/sec Ethernet	100M bit/sec Ethernet	Token ring	FDDI	TP-PMD	155M bit/sec ATM
Allied Telesyn Int'l Corp. (800) 424-4284 www.alliedtelesyn.com	TurboStack Series of Managed Hubs and Switches	8	80M	8					
Bay Networks, Inc. (800) 776-6895 www.baynetworks.com	System 5000	14	7.8G	12	12	9	5	5	12
(408) 988-2400	Centillion 100	6	3.2G	88	20	24			24
Cabletron Systems, Inc. (603) 332-9400 www.cabletron.com	MMAC-Plus	14	10G-70G+	504	168	168	168	168	28
Cisco System, Inc. (408) 526-4000 www.cisco.com	Catalyst 5000	2, 5, 13	1.2G-8.6G	264	134		11		39
Digital Equipment Corp. (800) 859-1758 www.digital.com	MultiSwitch 900	8	5.6G	12		2	4	4	4
	GigaSwitch/FDDI 3.2	11	3.6G		34		34		22
FORE Systems, Inc. (888) 404-0444 www.fore.com	PowerHub 7000 Multilayer Backbone Switch 2.6.4.1	5	1.6G	48	24		16		4
	PowerHub 6000 Multilayer Departmental Switch 2.6.4.1	3	800M	48	2		2		1
IBM (800) 426-3333 www.ibm.com	8274 Nways LAN Route Switch	5, 9	960M	96	64	48	16	64	16
	8260 Nways Multi-protocol Switching Hub	17	1.6G-9.7G	8		17	8		
	8270 Nways LAN Switch Model 800	8	512M			30			
Madge Networks, Inc. (408) 955-0700 www.madge.com	LANswitch (LET-36) Revision G	18	2.56G	128	64	18	18	18	8
NBase Communications, Inc. (818) 773-0900 www.nbase.com	GigaHub	12	16G	216	144	12	12	12	12
Newbridge Networks, Inc. (800) 368-4843 www.vivid.newbridge.com	VIVID-MLS 500, G5-E17M	14	7.2G	352	132	11	11		11
Optical Data Systems, Inc. (888) 637-7770 www.ods.com	InfiniteSwitch 6000 Series 1.0	12	1.28G	352	132		22		4
3Com Corp. (800) 638-3266 www.3com.com	Core8uilder 5000	17	10.6G	8	4	10	34		28
Xylan Corp. (800) 999-9526 www.xylan.com	OmniSwitch 3.0	8	(2)	96	16	48	16	16	64
Xyplex Networks (800) 338-5316 www.xyplex.com	Network 9000 Edge Hub	3, 6, 15	8.4G	280	28				

Products highlighted in colors were tested. • Blue Ribbon Award winner.

Footnotes: (1) Hardware: 12; Software: 3 (2) Frame bus: 960M bit/sec; Cell bus: 400M bit/sec - 13.2G bit/sec

Maximum port capacity									Maximum number of switched ports per LAN type						Switch module redundancy	Bridging protocols			Routing protocols	Management			Virtual LAN support						Price	Warranty
10Base-T	10Base-2	10Base-5	10Base-F	100Base-T	Token ring	FDDI	TP-PMD	155M bit/sec ATM	10M bit/sec Ethernet	100M bit/sec Ethernet	Token ring	FDDI	TP-PMD	155M bit/sec ATM		Source routing	Source routing transparent	Spanning tree		RMON MIB	SNMP Version 1	SNMP Version 2	IP address	MAC address	Port	VLANs span switching modules	VLANs span multiple hubs	Other	Mln. – max.	Months
192	64		96	2				1	8	2				1	•					•	•	•		•	•				$1,195-$31,965	12+
336			140	224	250	80	80	48	224	64	128			48	•	•	•	•	OSPF, RIP, PPP	•	•			•	•	•	•		$8,790-$59,425	12
								24	88	20	24				•	•	•	•		•	•	•		•	•	•	•		$1,995-$45,000	12
504	84	84	252	168	168	112	168	168	504	168	112	48	42	24	•	•	•	•	RIP, other	•	•		•	•	•	•	•	•	$6,690-$750,000	3
528			132	266		11	11	39	264	134		11	11	39	•			•	IGRP, OSPF, RIP, PPP, SLIP, other	•	•	•	•	•	•	•	•	•	$13,000-$100,000+	3
288	128	16	72	16	192	112	112	64	192	16	8	8	8	64	•	•	•	•	IGRP, MOSPF, OSPF, RIP, PPP, SLIP	•	•				•	•	•		$4,090-$7,135	12
				34		34		22		34		34	34	24	•			•	IP packet switching		•				•				$24,400-$167,500	12
96	96		96	24		10		4	96	24	16	6	16	1	•			•	OSPF, RIP, other	•	•				•			•	$14,320-$62,800	(1)
48	48			2		2		2	48	2		2		1				•	OSPF, RIP, other	•	•				•			•	$8,950-$24,850	(1)
96	48	48	48	64	48	16	64	16	96	16	48	16	16	16	•	•	•	•	MOSPF, OSPF, RIP, PPP, SLIP	•	•	•	•	•	•	•	•	•	$10,550-$67,000	12
192	204	204	136	56	320	28		42	168	68	120	34		42	•	•	•	•	OSPF, RIP	•			•		•	•	•	•	$3,315-$75,000	12
					30			2			30			2	•	•			OSPF, RIP, PPP						•	•			$6,600-$12,000	12
432	108	54	90	128	180	72	72	8	128	64		8		8	•	•	•	•	OSPF, RIP, PPP, other	•	•		•		•	•	•	•	$1,695-$4,095	12
432	96	48	96	144	192	72	108	12	216	144		12	12		•	•	•	•	Direct IP Switching	•	•		•	•	•	•	•		$6,000-$120,000	12
352	352		352	132	242	48		11	352	352					•	•	•	•	IGRP, MOSPF, OSPF, RIP, PPP, SLIP	•	•	•	•		•	•	•		$6,495-$80,950	12
384			224	144		22		4	384	144		22		4	•			•		•	•	•		•	•	•	•		$1,900-$79,000	12
408	204	102	170	204	340	96		28	408	119	136	34		28	•			•	RIP, PPP, SLIP	•	•			•	•	•	•		$995-$224,010	(1)
96	48	24	48	16	48	16	16	64	96	16	48	16	16	64	•	•	•	•	OSPF, RIP, PPP, SLIP, other	•	•		•	•	•	•	•	•	$7,950-$69,250	12
280			28	28					280	28					•			•	OSPF, RIP, PPP	•	•				•				$3,685-$100,000+	36

CHART COMPILED BY KATHY SCOTT

IGRP = Interior Gateway Routing Protocol **MOSPF** = Multicast Open Shortest Path First **OSPF** = Open Shortest Path First **RIP** = Routing Information Protocol

interface is tedious to set up and use. Also, it does not appear to be well-integrated with the SNMP or RMON components in the Catalyst 5000. Rather, it seems oriented more toward use with separate, stand-alone RMON probes.

Digital: Mixed-port ace

Digital has invested a lot in making its four-year-old, eight-slot MultiSwitch 900 chassis into a high-end switching hub. It has accomplished this mainly with a series of new modules called the VNswitch series.

VNswitch modules are offered in switched Ethernet-only versions and in combinations of switched Ethernet and your choice of Fast Ethernet, FDDI or ATM ports. The modules plug in to and interconnect over the 400M bit/sec VNbus of the MultiSwitch 900. Each module contains its own switching intelligence, thus distributing intelligence evenly across modules, in addition to its own SNMP agent for management.

Digital Equipment Corp.
MULTISWITCH 900 WITH VNSWITCH

Pros

- ▲ Plug and play for mixed LAN switching (100Base-T, FDDI and ATM)
- ▲ Good traffic monitoring application and user interface

Cons

- ▼ Limited high-speed port density (8-slot DEChub 900 chassis supports a maximum of only 16 Fast Ethernet or 8 FDDI ports)
- ▼ Some switching performance problems under high load

An array of other hub-type modules is offered for the same MultiSwitch 900 chassis, so this is a fairly flexible and configurable system. These other modules include token-ring MAU, Ethernet repeater and FDDI concentrator modules.

However, Digital doesn't offer a high-density 10/100Base-T MultiSwitch 900. Instead, two switched 100Base-T ports come on a switch module along with 12 switched Ethernet ports, so a fully configured MultiSwitch 900 can support a maximum of 16 100Base-T ports. Our test unit included three Ethernet/Fast Ethernet, one Ethernet/FDDI and one Ethernet/ATM module. Its list price was $51,000.

While the MultiSwitch technically supports a total gross switching bandwidth of 1.2G bit/sec, this is distributed over three 400M bit/sec channels. And all switched traffic passing between ATM, FDDI, Ethernet and Fast Ethernet goes over just one channel — the VNbus. Digital says it plans for future switch modules to also use the other backplane channels.

The vendor describes the VNbus as a serial, cell-based bus, although variable-length chunks of data are transported, not fixed-length, ATM-type cells. Access is arbitrated, as with the Cisco architecture. According to Digital, it is the sending module's job to perform conversion of the data, if necessary; for example, on packets going between a switched Ethernet and a switched FDDI module. A tagging protocol is used internally to designate what technology — and, if applicable, what VLAN — the data is associated with.

The ATM module's capabilities are fairly rich. Switches can be directly linked via ATM using a variety of tunneling techniques, or data can be shipped via an ATM uplink to an external ATM switch using standard ATM LAN Emulation 1.0.

By far the most significant advantage of the MultiSwitch 900/VNswitch system we found is its plug-and-play ability. We simply plugged in a random mix of Ether-

For a recent review of VLAN capabilities in switching hubs, as well as a primer on hubs in general, see Network World Fusion.

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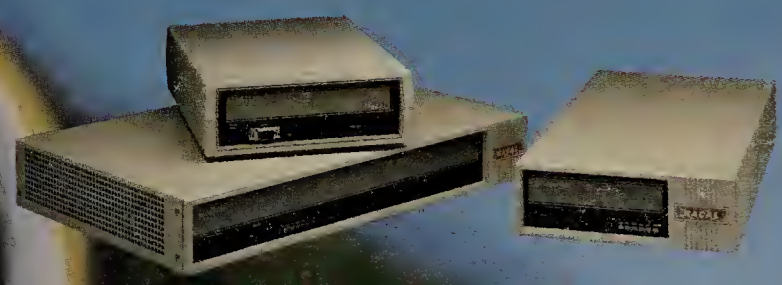

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net, Fast Ethernet, ATM and FDDI modules and were immediately able to send switched traffic between any ports. All the configuration and translation is done automatically.

However, while traffic of small to medium loads is switched neatly and automatically between different types of LANs, the system exhibited some peculiar behavior under heavy loads.

With the heaviest load test — four streams of 100M bit/sec each delivered on Fast Ethernet ports and switched on a round-robin basis to FDDI, ATM and other Fast Ethernet ports — there was usually some loss of data packets switched between Fast Ethernet and FDDI and also between Fast Ethernet ports. It appeared, however, that an excess of data was switched onto the ATM link. In other words, not all packets were forwarded correctly at high-traffic loads. Some outbound ports received too few packets, others received too many. Our conclusion: The system cannot reliably handle this load.

Digital's management software suite, called clearVISN, also includes separate applications for chassis/module management, VLAN management and traffic monitoring. The VLAN Manager Version 1.0 we tested was quirky and generally nonintuitive, even though all user actions are accomplished via point-and-click operations.

We found Digital's MultiChassis Manager Version 6.1 to be an effective tool for chassis and module management, but for this purpose, not quite as sophisticated or easy to use as CiscoView.

Digital's traffic monitoring application, RMON Manager Version 3.3, was the best of the management tools for this purpose, compared with the equivalent traffic monitoring applications from Cisco and Cabletron. Digital's RMON application is intuitive and integrates well with the traffic monitoring components integral within each VNswitch module.

Mier is president, Smithers is manager of lab test services and Scavo is lab test coordinator at Mier Communications, Inc., a Princeton Junction, N.J.-based network consultancy and product test center. They can be reached at (609) 275-7311 or via e-mail to ed@mier.com, rob@mier.com or tom@mier.com.

HOW WE DID IT

As you would expect, these are complex, high-end systems. Thoroughly evaluating them involves not just passing traffic through the various switched ports, but also exercising their various management applications, as well as understanding each one's unique backplane, bus and switching architecture.

We found that there are really three discrete aspects to managing these complex switching hubs: chassis management, including configuration; VLAN management; and traffic monitoring. It turns out that each of the vendors offers discrete management applications for these three functions.

For comparing performance, we delivered streams of data packets using Shomiti Systems, Inc. Century Analyzers to the switching hubs' 100Base-T ports, which had to be switched to other Fast Ethernet ports and to FDDI and ATM ports. In the heaviest load test, four streams of 100M bit/sec each were delivered on Fast Ethernet ports and switched on a round-robin basis to other Fast Ethernet ports, FDDI and ATM ports, depending on the switch's configuration. The maximum delivered load was about 600,000 packet/sec.

For assessing the throughput of traffic delivered via 100Base-T and switched to FDDI, we used Hewlett-Packard Co.'s Internet Advisor analyzers. We used Net2Net CellBlaster analyzers to measure the throughput of traffic switched to ATM 155M bit/sec ports.

SONET is in the air

Feature

Philadelphia utility zips LAN traffic over radio-based SONET net.

By Charles Bruno

Philip Adelizzi and Ted McDermott *(center and right) helped build PECO's SONET net, which Joe Kwasizur now operates day to day.*

Philip Adelizzi and Ted McDermott had reason to panic.

They were in the midst of a radical project at the utility firm PECO Energy Co., deploying unproven Synchronous Optical Network (SONET) microwave radios to ferry data from corporate offices to remote power generation facilities. Hanging over their heads was the threat that industry deregulation could derail their project or wreak havoc with its payback cycle. There also was a major restructuring of the IS department to deal with. Oh, and the SONET microwave radios showed up four months late.

But Adelizzi and McDermott kept their collective cool. Now, two years later, PECO Energy is reaping the benefits of their efforts. Instead of cramming 16M bit/sec token-ring traffic onto leased T-1 lines, the data flows freely across 45M bit/sec microwave radio links, resulting in less buffering at crucial router points.

PECO already was familiar with microwave technology; the company operated an analog radio net that passed data over a 60-mile stretch. But PECO was building a fiber-based OC-48 backbone in the heart of metro Philadelphia and wanted to complement it with SONET links to remote nuclear and hydroelectric power generation plants and other offices (see graphic).

PECO network executives say they built the microwave radio-based SONET net for one-third to one-fifth what it would have cost to lay fiber. Altogether, PECO spent an estimated $10 million for its microwave and fiber SONET facilities. It is expecting a seven-year return on that investment, both from migrating existing leased lines to the SONET net and using the SONET net to support new requirements.

The lure of radio

PECO's microwave odyssey began in 1994 when the company first laid plans for its OC-48 backbone and was searching for ways to extend high-speed links to facilities then being served by the analog radio net and T-1 leased lines. The lure of 150M bit/sec OC-3 bandwidth compelled PECO to investigate the then unproven SONET radios.

"We could have run fiber down those paths, but with the existing towers in place, fiber just didn't make sense from an economic perspective," says Adelizzi, a senior engineer in the company's Telecommunications Division.

Even though SONET microwave radios had not reached the market in 1994, PECO floated its request for proposal. They found two companies — Lucent Technologies, Inc. (then AT&T Network Systems) and Alcatel Systems — that said they could meet the equipment criteria.

PECO selected Lucent, which bid a SONET radio it was codeveloping with Harris-Farinon Corp. The kicker was Lucent's packaging of the MegaStar 2000 OC-3 microwave radios with AT&T DDM-2000 fiber multiplexers and integrated network management that handled both the radio- and fiber-based SONET nets.

The radios were set for installation in June 1995 but were delayed until October of that year. PECO engineers used that time to build out the OC-48 backbone and make sure it was fully stabilized before introducing the SONET microwave variable.

PECO is still waiting, however, for the integrated network management system Lucent promised. The utility is currently using separate management programs for the radio- and fiber-based nets.

"It's a matter of a software release, and we're expecting that shortly," Adelizzi says.

One huge advantage to SONET, he says, is its ability to support ring switching, which allows the SONET ring to heal itself in the event of a cable cut or radio outage. Data is sent in opposite directions around a ring, but each switch or radio receives the data from only one direction.

The TR496 path-switched ring algorithm calls for reestablishing switching links in 60 msec or less. That means all the T-1s in a path-switched ring (a maximum of 84) must be switched within that allotted 60 msec. The MegaStars, Adelizzi says, have handled reroutes in closer to 20 msec.

"We've [also] drastically reduced the burden on our Cisco 7000 routers," says McDermott, a telecommunications specialist in the company's Telecommunications Division. With a SONET infrastructure in place, PECO streams 16M bit/sec LAN data over the wide area using High Speed Serial Interface cards in its routers. Previously, that data was chopped up and buffered in router queues awaiting passage over T-1 links. Now it is sent immediately over one of three 45M bit/sec wide-area links, eliminating the WAN bottleneck.

The most arduous task PECO faced was the up-front needs assessment that paved the way for project approval.

While admitting it is not an exact science, Adelizzi projected the company's T-1 needs for 20 years and multiplied them by a conservative five-year estimate on circuit prices to create a present worth analysis of the existing T-1 net.

PECO then measured those costs against the projected capital outlay and associated overhead and administration costs for building the SONET microwave network. From that analysis, PECO developed an internal rate of return for the SONET project and found it would pay back in seven years.

Is SONET for you?

While PECO deployed its SONET gear over the wide area, Adelizzi says the technology has some applicability in a metropolitan-area setting — provided you own or can rent the rights of way needed to build microwave towers.

In a campus situation, he says, most users would turn to fiber, but they should consider SONET microwave for unusual circumstances — such as trying to link two sites across a highway.

For their part, McDermott and Adelizzi agree they've got a winner in SONET radio. "My view is it's stable," Adelizzi says.

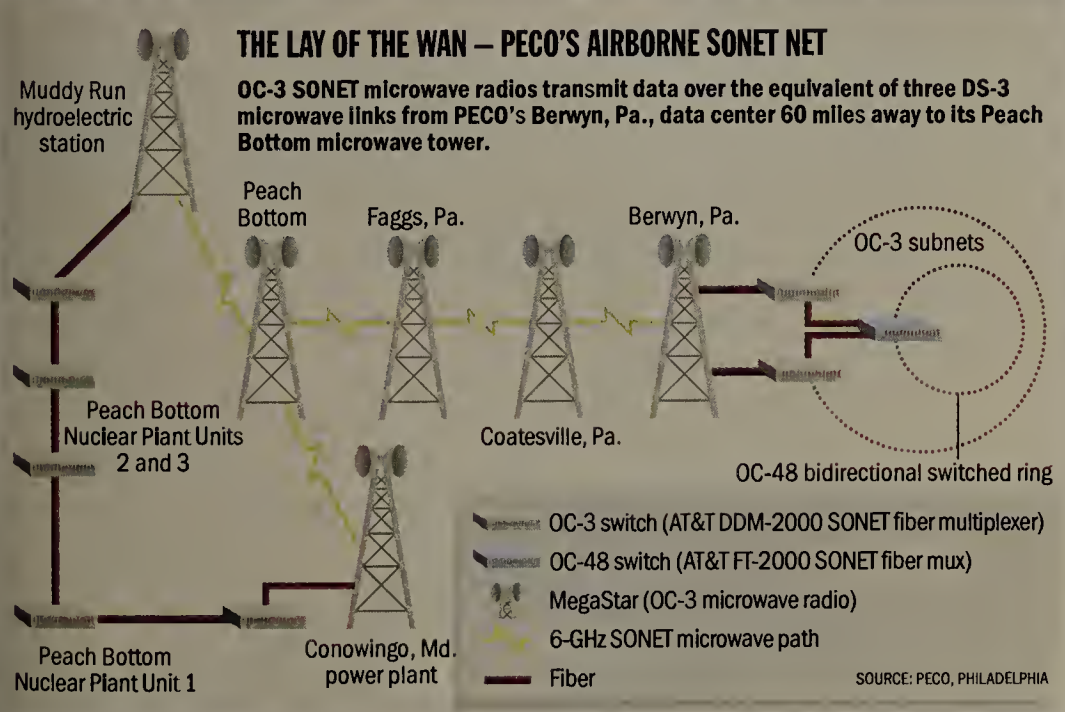
Now when internal customers request a T-1 to a remote site, they get routed over the SONET net instead of leasing a private line for $500 to $700 per month.

In addition, the company hopes to reduce its reliance on about 200 leased lines it already uses by cutting over users to the SONET facilities.

"There isn't much difference between being on the microwave and the fiber portions of the network," Adelizzi says. "If the paths are designed correctly, in a digital world there will be no degradation of service quality." ■

THE LAY OF THE WAN — PECO'S AIRBORNE SONET NET

OC-3 SONET microwave radios transmit data over the equivalent of three DS-3 microwave links from PECO's Berwyn, Pa., data center 60 miles away to its Peach Bottom microwave tower.



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■ *The Burton Group, a network computing consultancy, and the Network Applications Consortium user group will host the* **Catalyst Conference 97** *in* **San Francisco July 16 to 18.**

The event will focus on directory interoperability and implementation. It will also address the challenges of using public key security and certificates in the intranet environment and the impact of the emerging intranet server platform on application building.

The complete conference costs $1,595 for The Burton Group customers and $1,795 for noncustomers.

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■ **KnowledgePool,** *an international IT training consortium, has formed a new facility in Dallas.*

The location will offer Microsoft-accredited courses for Windows NT 4.0, Exchange, TCP/IP and SQL, via instructor-led, CD-ROM and online training. The program will also provide trainees with 24-hour online support from an existing global network of KnowledgePool instructors.

In addition, KnowledgePool has announced plans to roll out the service nationwide over the next two years.

Individual courses cost $400 to $2,000.

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■ **New Riders Publishing** *has released its* **MCSE Training Guide: Windows 95.**

The tome features information on Microsoft certification programs and on the technical wizardry needed to install, configure and run Windows 95 applications.

The companion CD-ROM contains several Windows 95 test engines to help network administrators and other IT professionals prepare for the exam.

The book/CD-ROM set costs $59.99.

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It's time to check your career's vital signs

Visit a specialist for a thorough checkup and assessment of your professional health.

By Frank Schoff

Most of us would agree that it's not wise to wait until we're faced with a life-threatening illness to get a thorough physical checkup, but few people realize the importance of preventative maintenance to ensure their professional well-being.

Every year, thousands of people undergo diagnosis after their careers have been dealt potentially life-threatening blows. That process is called outplacement. As its name suggests, outplacement's emphasis is on the word "out" — out of a job and on the outside looking in.

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That's not a knock on outplacement; it's a valuable resource that you should use if it's available.

In fact, many of the steps involved in outplacement are so helpful and effective that they should be used for proactive career management by those who are gainfully employed. Don't make the mistake of waiting for an employer to send you to outplacement to revitalize an ailing career. Instead, take the initiative and schedule a checkup.

Consult the experts

Just what is a career checkup? It's a comprehensive review of your career's present status and direction, your motivations and desires, and your future options. Like a physical exam, this checkup is conducted by a professional. And it's an assessment that is most effective when it is routinely conducted rather than performed as a one-time fix for a specific career affliction.

Career counseling is also similar to medical care in that neither is inexpensive. Depending on the counselor's credentials and geographic location, it could cost $100 to $300 per hour. Based on an average initial consultation length of eight hours, a comprehensive career checkup could set you back $800 to $2,400, with a periodic maintenance cost of $200 to $600.

Is it worth it? That answer is a very personal one. How much would you pay to have a career that is truly rewarding and satisfying? Is it worth that much to optimize your income-producing potential or to avoid six months of lost income resulting from a career misstep?

Just as you've got to pay a physician to maintain your physical health, it makes sense to invest in your career health. After all, your job satisfaction can also impact your physical and mental health.

And just as you probably put some thought into selecting a doctor, it's also prudent to select the right career caregiver. Choose a formally trained and licensed career counselor who has experience in a work setting. Be-cause the counselor should ideally un-derstand and relate to your specific functional expertise, psychologists or psychiatrists who provide general therapy may not be well-suited to the job.

Just as you've got to pay a physician to maintain your physical health, it makes sense to invest in your career health.

How do you find a career counselor? The best resources are likely to be personal referrals.

Someone who has successfully worked with a professional career counselor can serve as an excellent resource. Outplacement services may also be able to suggest leads, as may human resources professionals. If you are uncomfortable asking at your own workplace, get a friend to ask his or her employer on your behalf.

In addition, check libraries or the Internet for professional associations that can provide referrals. Beware of basic yellow pages listings — career counselors can hang up a shingle in many states without having any specific credentials to back up the title.

The career checkup consists of extensive interviews plus a comprehensive battery of tests, followed by a formal report and feedback. This initial process typically takes six to 10 hours to complete and, as a result, could require more than one meeting with the counselor.

Follow-up meetings generally occur every 12 to 24 months and last approximately two hours. A career- or life-altering event, such as a change in jobs, a new boss, or a more personal event such as an inheritance, marriage or divorce, usually triggers these appointments.

Although some workers may prefer the convenience of a checkup that does not require face-to-face contact, counselors agree that there should be at least one initial meeting in person. However, follow-up sessions can be conducted by telephone.

An objective professional's insights and advice should help you gain a wealth of knowledge. You'll understand the nature and underlying cause of your work relationships, the aspects of your career that you enjoy most and the aspects at which you are most successful.

Equally important, you'll recognize the elements that are the least rewarding and satisfying. All this introspection will improve your ability to relate your career to other life values, such as family values, spiritual values and your own self-image.

ASK THE RIGHT QUESTIONS

Be sure to interview prospective career counselors to learn about their experience and expertise. And remember that no matter how impressive a counselor's credentials are, it's important to choose someone you feel comfortable with. Here are some good questions to ask:

- What specific licenses and accreditations do you have?
- What previous work have you done in this field?
- Have you worked in a corporate setting?
- Have you worked with people that possess my functional expertise?
- Have you personally undergone a career transition?

You'll also receive advice on tactics to employ to optimize your strengths, as well as suggestions for handling or avoiding unsatisfying and unrewarding situations and relationships.

Use this advice and take steps to develop a strategic career plan. As you go through this process, you may even identify and choose to pursue career options that are not straight-line progressions of your current career direction. And by developing a relationship with a career counselor, you'll have an ongoing resource to use as a checkpoint as you move forward.

No magic pill

No matter how much you pay, don't expect a counselor to carry you down the road ahead — you'll need to pull some of your own weight. You will probably not get a specific career destination with a detailed map of how to get there, nor will you be told what to do. A career counselor cannot remove your self-imposed limitations, and most certainly, a career counselor will not find you a job.

Schoff is president of Management Recruiters in Cedar Mountain, N.C., and specializes in the placement of networking professionals. He can be reached at (704) 884-4118 or by fax at (704) 884-3512.

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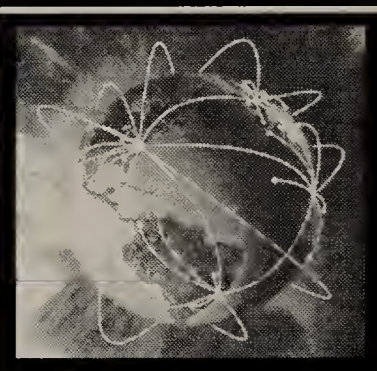

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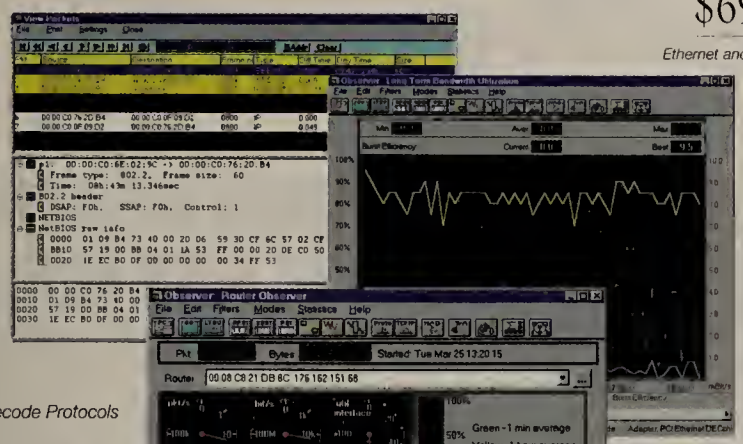

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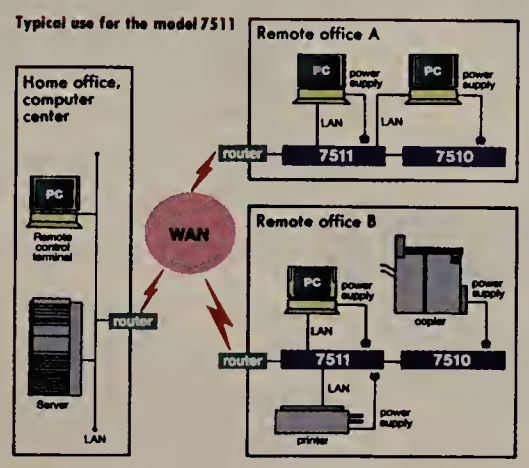

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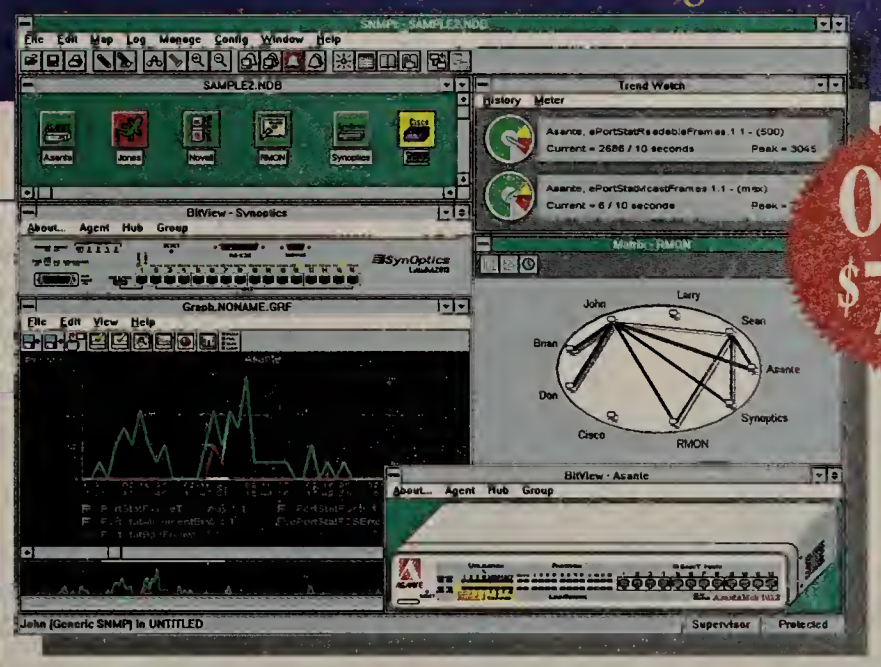

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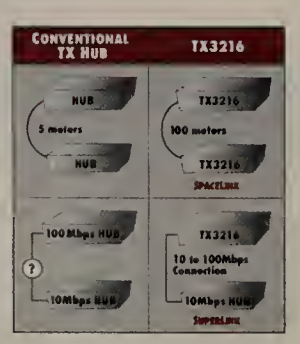

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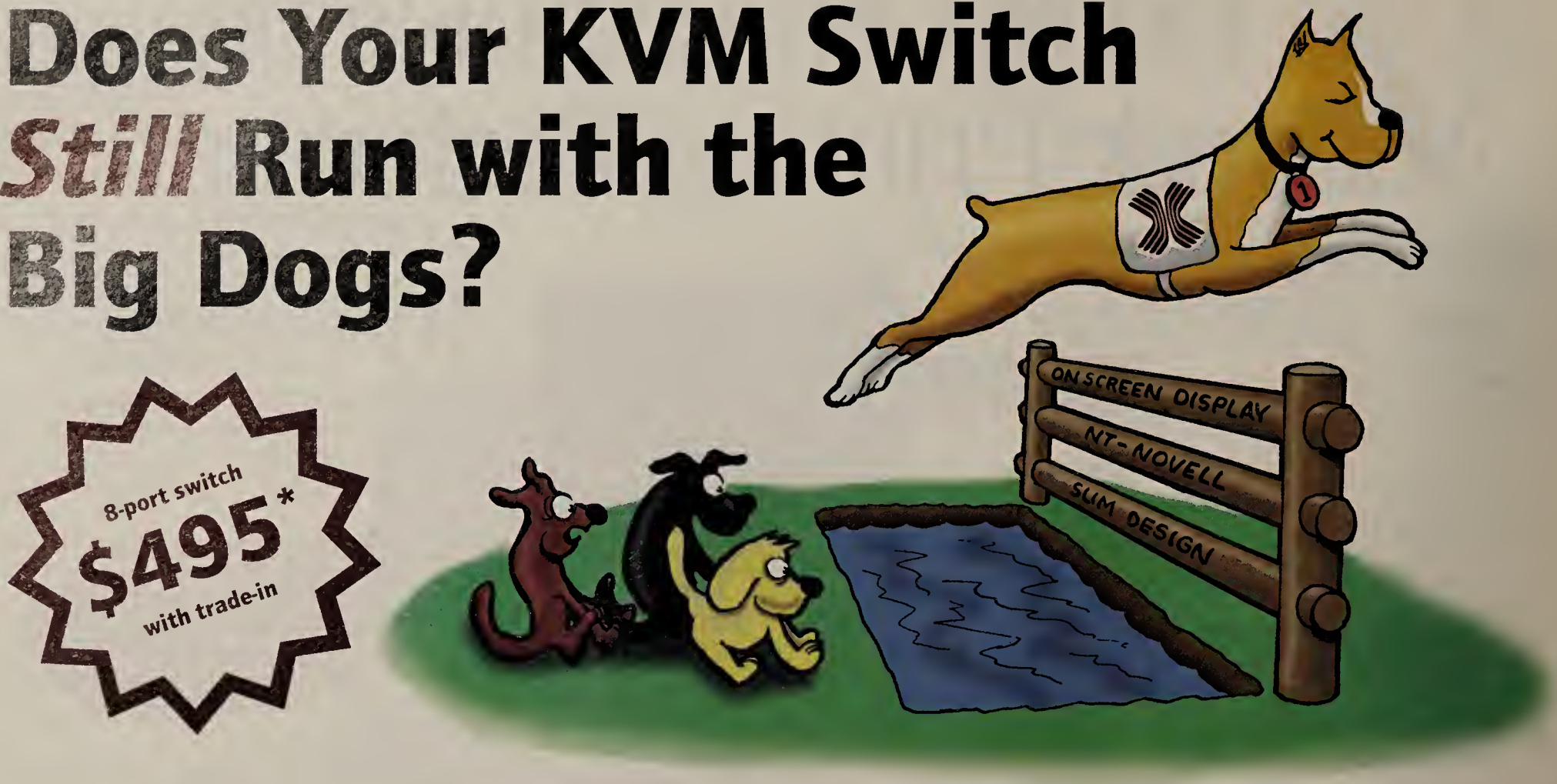

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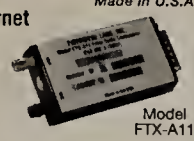

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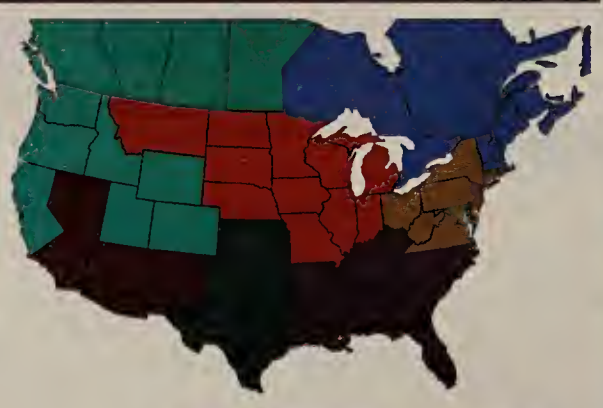

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Continued from page 1

Now try doing that with your carrier. Just the opposite is bound to happen: You'll be getting exactly the same metropolitan-area or wide-area transmission capacity — at a higher price. Yet carriers, like customers, have access to ever-higher capacity switching systems.

From private lines to frame relay ports and virtual voice networks to toll-free services, telecom prices have been marching steadily higher recently, in direct contrast to the computer industry's Moore's Law. That's the dictum that states the computer processing power available for a constant amount of money doubles every 18 months. It's not just computers. Everything, it seems, including software, printers and basic networking gear, is getting less expensive and more powerful all the time.

TELCOS DON'T OBEY MOORE'S LAW

In 1965, Gordon Moore observed that memory chips double in capacity every 18 to 24 months. This observation has been used to predict the dramatic price/performance gains made over the years by PCs and PC-based servers.

If Moore's law did affect carriers, T-1 circuits that were first tariffed in 1985 would either cost about $20 per month by now or would pump data at well over 300M bit/sec.

Of course, many users have discovered they can get lower voice and data services prices but not by standing around and waiting for them. Instead, they have to expend blood, sweat and tears in repeated negotiations with their carriers, usually involving threats to bolt to another carrier — if they can find one offering the same services.

But even then the carrier price cuts are marginal rather than geometric in nature.

"When they say something is supposed to be cheaper, like better long-distance or local calling plans, we don't see much change year to year," says Ron Kopitowsky, director of technology planning at New York's Metropolitan Transportation Authority. "We would like to see more innovative prices from the telecom world that we see from the PC world."

Experts say the reasons that doesn't happen — and isn't likely to happen anytime soon — boil down to regulation, equipment depreciation cycles and Wall Street, where big carriers have to answer to millions of shareholders.

Take regulation. According to national policy, all Americans are entitled to telephone service at a reasonable rate. But the true cost of running wire to rural residents is several times higher than the cost of serving urban and suburban residents. As a result, local phone companies are subsidized for providing universal service, largely through explicit and hidden surcharges on local and long-distance telephone bills.

This was supposed to be fixed by the Telecommunications Act of 1996. Yet the immediate effect of the law appears to be the opposite. The Federal Communications Commission is using the new law to justify a new entitlement: Internet access at schools and libraries.

The issue boiled over last week at a hearing of the Senate Commerce Committee, where Committee Chairman John McCain said the new subsidy program is too expensive.

"Phone rates are going to go up across the country," Mc-Cain scolded outgoing FCC Chairman Reed Hundt. "You know it and I know it, and there's going to be a backlash."

Analysts also complain that regulators often unintentionally prevent carriers from innovating. "There are some technologies that haven't taken off because the regulations just make it stupid to pursue," says Mark Langner, senior telecom research associate at San Francisco investment banking firm Hambrecht & Quist, LLC.

For example, Langner says, the high cost of wireless connections might be much lower today if the government had allowed nationwide cellular services to duke it out from the beginning. "But instead, the government split up cellular into 230 different areas," he says.

Regulators also generally forbid carriers, especially regional Bell operating companies, from taking the profits from one service and using them to subsidize another, says Brett Azuma, an analyst with Dataquest, Inc. in San Jose, Calif. Some carriers bend over backwards to keep the prices of services such as ISDN, frame relay, ATM and network-based voice mail artificially high to avoid regulators' accusations of using consumer phone-line revenue to subsidize advanced data services, Azuma says.

Sometimes bringing those new services to market is a financial drain for carriers, at least at first. Despite the change from mechanical to electronic central office switching in the 1970s and 1980s, such CO switches still cost several hundred thousand dollars apiece for the telephone companies to install. And AT&T revealed earlier this year that it will take $8 billion to $9 billion to complete its upgrade to Synchronous Optical Network (SONET) and ATM switching over the next few years.

As a result — unlike PC and internetworking vendors — at any given moment, large carriers have enormous embedded investments in legacy systems. That makes forklift overhauls nearly impossible, many experts note. What's worse, generally accepted accounting practices insisted on by auditing firms for the telecom industry require carriers to depreciate their network equipment using seven-, 10- and 15-year schedules, says Thomas Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J.

Consider the adoption by MCI Communications Corp., Sprint Corp. and WorldCom, Inc. of dense wavelength division multiplexing (DWDM).

The latest DWDM products will let carriers break one fiber-optic cable into 16 separate channels, essentially boosting a carrier's fiber capacity to 16 times its original capacity. Yet users should not expect to see financial benefits anytime soon, according to Fred Briggs, MCI's chief engineering officer. Why not? Because MCI wants to compete on value-added features rather than price.

"If the vision of universal, high-bandwidth data services — which the carriers so like to promote in their corporate advertising — is ever to become a reality, prices for transmission bandwidth will have to drop by at least a factor of 100," says Jonathan Turner, a member of the computer science department at Washington University at St. Louis in a recent 'Net posting.

"Breaking this impasse requires a new approach to pricing of long-distance circuits — one that is based on real costs, not some outdated accounting rule."

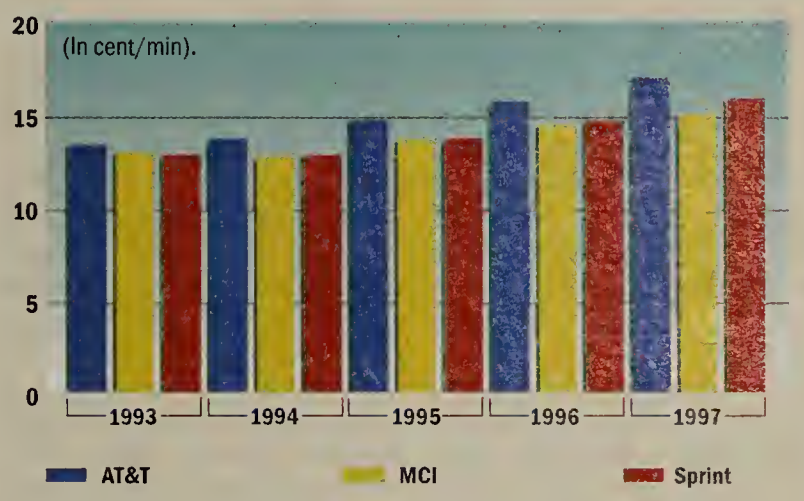
But even more pressure to avoid price cuts, even when they would be technologically feasible, comes from Wall Street, says Joseph Kraemer, head of the telecom consulting practice at EDS Corp's A.T. Kearney division.

AT&T must satisfy stockholders with activities that are profitable today or will turn an immediate profit tomorrow, he says.

Senior Writer Tim Greene contributed to this story.

DIGGING DEEPER INTO USERS' POCKETS

Even with a dedicated access line, the basic per-minute prices for popular Big 3 outbound business calling services have been rising steadily for five years.



Services used for comparison are AT&T's UniPlan, MCI's Vision and Sprint's Clarity. Prices shown are taken from the month of January for each year. Term and volume discounts are not included.

SOURCE: HTL TELEMANAGEMENT, BURTONSVILLE, MD.

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SBC threatens FCC over access charges

By David Rohde
Washington, D.C.

Huge regional Bell operating company SBC Communications, Inc. last week told the Federal Communications Commis- sion in writing that it will sue the agency if the FCC does not revise major parts of its recent access charge and universal service decisions.

SBC also asked the FCC not to exempt long-distance carriers from paying access charges if they enter the local exchange market by purchasing RBOC network elements.

The FCC ruled in early May that RBOCs and other large local exchange carriers must reduce their per-minute, long-distance charges in exchange for new flat-rate fees imposed on long-distance carriers and business end users.

The FCC's goal, acting on provisions of the Telecommunications Act of 1996, was to bring long-distance access charges more in line with the RBOCs' actual costs while still raising funds to expand universal service to include Internet access at schools and libraries.

SBC essentially said the FCC should leave per-minute access charges alone and let local exchange competition drive them down.

Because it is considered extremely unlikely that the FCC will grant SBC's request for a stay of its own rules, a lawsuit is now considered a near certainty. "The commission will say no, and they will no doubt go to court," said Colleen Boothby, a Washington, D.C. user attorney.

The stay request was actually filed by SBC's three principal telephone company subsidiaries. Following SBC's recent merger activity, those telcos now encompass the dominant local carriers in the Southwest and West Coast (see graphic). Observers said it was significant that SBC is the first RBOC to move toward suing the FCC in light of its reported recent merger talks with AT&T.

Boothby said she was appalled that SBC would sue, given the "softball" nature of the access charge reductions. Numerous user groups complained around the time of the FCC decisions that the agency should have gone further in reducing per-minute charges. The user complaints were a result of the FCC imposing an increase on monthly subscriber line charges that appear directly on users' phone bills (*NW*, May 12, page 1). ■

Rapid City

Continued from page 1

Last month, House announced that the company would support Gigabit Ethernet technology across its product line as part of Bay's Adaptive Networking strategy, but he did not provide details about where Bay would get the technology (*NW*, May 12, page 6).

Done deal?

Although the situation remains fluid and any deal could still fall apart, a source familiar with the sale said, "A deal is probably a week away."

In addition, Rapid City President and CEO Joe Kennedy recently raised about $12 million in its second round of funding, but that financing was put on hold so Rapid City could entertain the Bay deal.

Speaking of financing, Bay may not be in a position to pay big bucks for anything given that the company's stock was hovering at only $22 per share at press time.

Bay's 52-week stock price has taken a beating, ranging from a high of $30.62 to a low of $15.37. In January 1996, Bay's stock was up to around $48 a share.

Bay's low stock price is only one of a host of problems with which the company has been struggling.

In the past 12 or so months, Bay has had flat to negative revenue growth and has undergone a wholesale change of its executive staff, including a new CEO, a new chief technology officer, a new chief financial officer and a new executive vice president of sales and marketing.

Some industry analysts said an acquisition of red-hot Gigabit Ethernet start-up Rapid City could give Bay just the spark it needs to turn things around. Others said the company is rolling dice to place such a high value on unproven products from a start-up.

Rapid City demonstrated its FIRST family of Gigabit Ethernet devices at NetWorld+Interop 97 last month in Las Vegas. Rapid City's box was "zipping 7M packet/sec, so we know the processor works," according to John Armstrong, principal network analyst at Dataquest, Inc. in San Jose, Calif.

The start-up, however, is not yet shipping product. So it is hard to tell what works and what does not, analysts said. Rapid City is expected to ship product later this month.

Still, Dataquest expects to see Bay make an acquisition to compete in what is expected to be a highly competitive market. The Gigabit Ethernet switch market has been projected by Menlo Park, Calif.-based consultancy Dell'Oro Group to reach $980 million in worldwide revenue by the year 2000. More than a dozen vendors — start-ups and large, established players — are in this market.

PROFILE: RAPID CITY COMMUNICATIONS

Founded: April 1996

Products: Gigabit Ethernet switches with built-in routing

Employees: 35

Revenue: Not available, privately held

Financing: Raised $6.25 million in first-round private funding

Todd Dagres, a partner at Battery Ventures in Boston, said Bay needs to make an acquisition in the Gigabit Ethernet arena but is not convinced Rapid City is the best choice.

"Bay should acquire the company that has the best product and, in my opinion, Rapid City is not the technical leader in [the Gigabit] space," he said. Dagres said other upstarts, including Extreme Networks, Inc., Packet Engines, Inc. and Prominet Corp., have technically superior products.

But Armstrong disagreed with that assessment.

"There's a good fit between those two companies because both Bay and Rapid City believe that the switch should also perform a routing function," Armstrong said.

If Bay were to acquire a Gigabit Ethernet start-up, it could plug some product line holes.

"Bay would get a higher end Gigabit switch with Layer 3 capability to complement its existing ATM solution," he said. "This would be important strategically for Bay to try to reassert itself in the backbone."

Bay would gain Rapid City's entire family of products, including a high-end backbone chassis, a midrange wiring closet switch and a desktop device.

In addition, Bay would inherit from Rapid City an unannounced workgroup switch that will support four to eight Gigabit Ethernet ports.

"Bay is a big enterprise vendor, and you would expect that they would have a big presence in this market," Armstrong said. "They shouldn't drag their feet because they just might get caught short." ■

Bay

Continued from page 1

access and routing modules.

In the channel-attached gateway arena, Bay will go up against some familiar competitors: Cabletron Systems, Inc., Cisco Systems, Inc. and IBM.

Cabletron has been shipping Channel Interface Modules, which support parallel and IBM fiber-based Enterprise Systems Connection (ESCON) attachments, for its MMAC-Plus switch for about four years.

The modules provide mainframe connectivity for users on Ethernet, token-ring, FDDI and ATM nets.

Cisco has been shipping Channel Interface Processors (CIP) for its 7000 and 7500 routers for almost three years. The CIP, which also supports parallel and ESCON connections, appears to the mainframe as a channel-attached 3172 controller and routes incoming TCP/IP traffic to TCP/IP-based applications on the mainframe. The CIP also supports SNA traffic, which allows Cisco routers to replace FEPs.

IBM's 2216 Multiaccess Controller is a router that can support SNA and TCP/IP connectivity with ESCON-only mainframe channels. CNT's Channelink supports parallel and ESCON links.

Other players in the channel-interconnect market include Microsoft Corp. and Polaris Communications, Inc., which have products that attach Windows NT servers to IBM mainframe channels. Microsoft's products are based on technology from Bus-Tech, Inc. in Burlington, Mass.

Sources said Bay originally approached Bus-Tech — which supplies channel technology to Cabletron — but Bus-Tech did not have the right products for the System 5000. Bus-Tech Vice President Joe Makoid declined to comment but seemed enthused about Bay's entry into the channel-attach market.

"If they are doing that, it is the right thing," Makoid said. "It consolidates redundant pieces of hardware. You no longer need a front end, you don't need a 3174 controller, you don't need a gateway PC. It's easier to manage. It's going to give you better performance, and it is less expensive."

That might be why it is grabbing the attention of Bay users.

"We're looking at consolidating our 3174 network, getting rid of [Synchronous Data Link Control lines]," said Eric Ferguson, network engineer at Maryland Casualty in Baltimore. "So this would be of interest to me, of course."

"We do see a requirement" for channel-attached switches and routers, said David House, chairman, president and CEO of Bay. House declined to comment beyond that though, as did Bay spokespeople.

Mark Knittel, vice president of product and business development at CNT, said there is "no formal relationship between CNT and Bay." He would not comment beyond that.

As a result, details on Bay's channel module, such as processing power, number and type of channel attachments, and number of supported sessions, could not be learned by press time. Sources said the module will run CNT's Brixton SNA gateway software and provide Web browser access to mainframe data.

The Brixton software includes a package called PU2.1 SNA Server, which makes mainframe applications and data available to users on TCP/IP. CNT also makes the Channelink Integrated Gateway, which combines Brixton software with Channelink channel-attachment hardware to provide users with access to SNA applications over TCP/IP networks.

When fitted with CNT technology, Bay's System 5000 can emulate an IBM 3172 gateway, if users want to run TCP/IP applications on the IBM mainframe, or function as a TN3270 server for access to native SNA applications from TCP/IP nodes, sources said. This would eliminate the need to run a TCP/IP stack on the mainframe.

Sources expect Bay to ship its channel attachment module before the end of the year. Although Cabletron and Cisco have been shipping for years, the market for interconnect controllers is still ripe. ■

Vitria

Continued from page 1

implement.''

While it looks like push, Vitria's technology is properly described as publish/subscribe, which has been around commercially for about 10 years. The idea is this: Applications publish data and subscribers tune in to channels of interest and receive that information in real time. To date, however, the technology has been limited to LANs and typically did not scale well.

Vitria, founded by some of the pioneers of publish/subscribe technology, is extending the technology to the Internet and intranets with its new Business-in-Realtime product family.

A retailer, for example, might use Vitria's first product, Velociti, to transmit data from a scanned bar code to an application that tracks inventory stocks. Companies used to have to batch-process most of that type of information, which could take hours, if not days.

Through the use of the publish/subscribe technology, data can be pushed out and acted on within seconds. ''It's actually the true push,'' said JoMei Chang, Vitria's president and CEO, noting that what commonly passes for ''push'' today is really a scheduled pulling of stored information.

Vitria executives helped create publish/subscribe while working for other companies. Chang earned patents at AT&T's Bell Laboratories for reliable multicast protocols relating to pushing information from one source to many. Chang later cofounded Teknekron Software Systems, Inc. with Dale Skeen, principal author of the first distributed publish/subscribe patents.

Skeen and Chang left Teknekron, which is now TIBCO, Inc., to found Vitria. Whereas the TIBCO technology was developed for LANs and now has to be adapted for WANs, Vitria's product was built from the ground up with WAN-based intranet and extranet applications in mind, Vitria officials noted.

''Requirements have scaled since TIBCO was created,'' said Mitch Kramer, a contributing editor with Boston-based Patricia Seybold Group, Inc. ''The difficulties the older products have are going from tens of users to thousands of users.'' But Kramer said TIBCO has ''a pretty good strategy for getting that done,'' partnering with companies such as Cisco Systems, Inc. ''Ninety percent of the world has Cisco routers,'' he said.

Vitria promises guaranteed delivery of information with three classes of service possible (reliable, guaranteed or transactional), scalability to the tune of at least 10,000 messages per second, and interoperability with multiple languages and databases through the use of distributed object technology.

The product complies with the Common Object Request Broker Architecture's Internet Inter-ORB Protocol. Plans call for support of IP Multicast in the third quarter and Microsoft Corp.'s Distributed Common Object Model in the fourth quarter. The product also features a Java-based management tool for integrating applications and databases.

Velociti, with prices starting at $4,995 for a single server, is available on Windows NT and Unix.

Two application processing engines, code-named Martini and Ice, are due in the second half of the year. Using the engines, companies can refine the published information and enable decision support systems to take action, Skeen said.

✆ Vitria: (415) 237-6900

Get more info online at www.nwfusion.com. DocFinder: 2324

GIANT

Continued from page 1

broadband Internet and LAN-to-LAN service.

GIANT ordered 200 pairs of the copper lines from US WEST, Inc., signed up an apartment developer to beta-test the service and began wooing customers, such as a law firm, the University of Iowa Medical Center, several private businesses and the University of Iowa. GIANT projected it would need 500 copper pairs within a year.

Then late last month, US WEST dropped a bomb. It was taking the burglar alarm circuits off the market throughout its entire 14-state region. GIANT could have the 200 lines it already ordered, but could order no more after July 1.

''What it really effectively does is eliminate anyone else from selling DSL service but US WEST. That would not bother me too much, except they won't be doing that in this area for several years,'' said Sajan Sahu, a principal with GIANT.

US WEST says it is not trying to stifle competitors in the DSL market. It just wants to protect the overall performance of its network by keeping down crosstalk interference among DSL lines wrapped in the same trunking cable.

With relatively few lines being used this way, the risk of interference is low, admitted Joe Glynn, director of network design for US WEST. But if a high percentage of wires in a bundle are used for DSL, the risk goes up that two such circuits will interfere. ''It's just statistics that this hasn't happened yet,'' Glynn said.

It has not happened yet in Chicago or Boston, either, where two Internet service providers are using the same model GIANT is using to offer high-speed Internet access. In fact, GIANT and the other DSL providers put their offices as close to phone company switching offices as possible on purpose, minimizing the possibility of the crosstalk problem.

Neither Ameritech Corp. in Chicago nor NYNEX Corp. in Boston has told the ISPs they plan to follow US WEST's lead and cut off availability of their burglar alarm circuits, but SBC Communications, Inc. is cracking down.

Leonard Conn, president of ioNET, Inc., an ISP in Oklahoma City with plans to sell DSL Internet access, said SBC is enforcing tariff restrictions that prevent running DSL on alarm circuits.

''This is a change in enforcement that is specifically aimed at this service,'' said Conn. An SBC spokesman said he was unaware of any such enforcement change. But Conn has thought of a workaround. His company will get carriers that have the legal status to negotiate the lease of copper phone lines from the monopoly local exchange carriers to lease the lines it needs.

Meanwhile, GIANT is still waiting to get the 200 alarm lines it already ordered. The lines have been trenched across the street from the US WEST switching office to GIANT's side of the street but have been sitting there for a couple of weeks waiting to be terminated at GIANT.

Regardless, GIANT remains confident it can do well against US WEST. ''The real issue is that we're more agile than they are,'' Sahu said. ''They don't have the teams to install any of this. We can.'' ■

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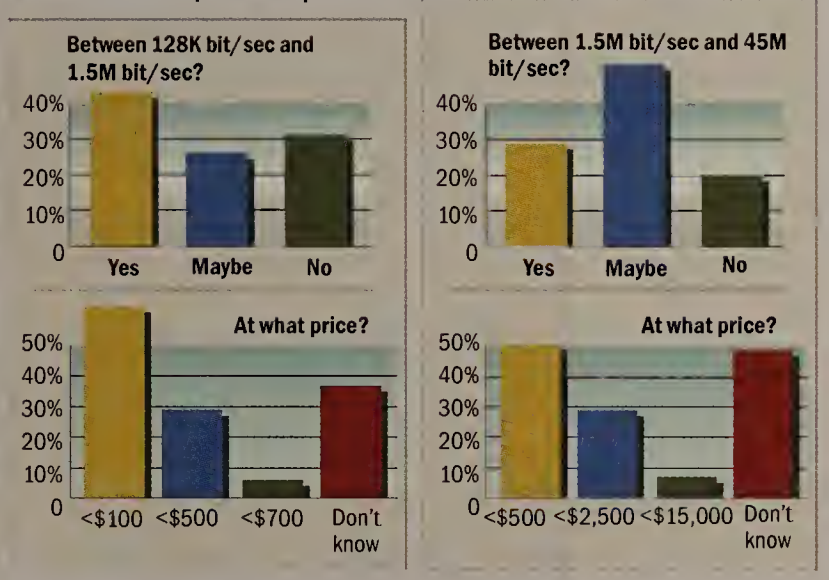
WHO WANTS DSL?

Fifty-one Fortune 1,000 companies were asked whether they would be interested in DSL at certain speeds and prices:



SOURCE: FORRESTER RESEARCH, CAMBRIDGE, MASS.

Another ISP loses independence

Intermedia snatches up Digex for $150 million.

By Denise Pappalardo
Tampa, Fla.

The number of independent Internet service providers dropped by one last week after Intermedia Communications, Inc. (ICI) announced its plan to acquire Digex, Inc. for $150 million.

Digex, a national ISP based in Washington, D.C., is the fourth ISP to be acquired by a carrier.

ICI will buy 51% of Digex stock for $13 per share, equaling roughly $150 million, said David Ruberg, president and CEO of ICI.

Digex adds 2,000 business and government customers to ICI's approximately 16,000 users.

By the end of 1998, ICI plans on transferring all Digex customers to its network. The first target areas will be those where Digex is leasing costly DS-3 connections from other carriers.

It is generally believed that ISPs like Digex will benefit from having a parent that owns its fiber lines (*NW*, May 19, page 27), but users don't believe it is going to have a strong impact on their service needs.

Tod Bryant, director of information systems at New York Life Benefit Services, Inc., a subsidiary of New York Life Asset Management, lived through the acquisition of UUNET Technologies by MFS and later by WorldCom, Inc.

Bryant said he did not notice any significant changes based on the merger.

Although ISPs owned by facilities-based carriers should have deeper pockets, an ISP's overall success is really not a money issue, Bryant said.

''Any growing company needs to manage their growth well . . . UUNET has shown that with good services and customer attention,'' he said.

The ICI-Digex deal has already been approved by the boards of both companies and is expected to be final by the end of the summer. ■

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Backspin

Chapter and worse: Why trouble is good for Gates and the rest of us

Chapter 1: Of caffeine and carrots

I have written about Java a couple of times in the past, and in the intervening months, it has begun to look like a runaway freight train. Every day someone announces something about Java, and the world greets it with open arms and open checkbooks — particularly investors.


Mark Gibbs

This rampant enthusiasm is very interesting. While Java is an excellent language and has some features that make it a compelling vehicle for cross-platform development in client/server and Web environments, that's not why it's so powerful. It's the competitive dynamics that surround the language that are really fascinating.

The carrot for vendors in this marketplace is the opportunity to weaken Microsoft's stranglehold on PC standards.

Chapter 2: In which Bill gets a message

Out in the computer industry, there are one or two companies that don't care for Microsoft too much. All right, all right, there are hundreds, but the real point is that until Java, these guys were all blowing

Now that they have a rallying flag to follow ... all of Microsoft's enemies have started to form armies.

smoke. Since the start of the PC revolution, they have had no tool with which to erode Microsoft's hegemony of the market and standards. Then along came the Internet, then the World Wide Web, and then Sun's Java.

By the time Java had become so powerful, and done so with amazing speed, Microsoft had no choice but to follow. Although it tried to manipulate the market as it had done successfully so many times before, perhaps for the first time in its corporate life, Microsoft wound up toeing someone else's line.

Now that they have a rallying flag to follow, sporting the image of a steaming coffee cup, all of Microsoft's enemies have started to form armies.

Leading the pack that wants to rip out Microsoft's throat is the industry's pinup vendor, Netscape. Following close behind in the baying, bloodthirsty pack are the likes of Novell and Sun (now thick as thieves). Then there's IBM pouring a gazillion dollars (or thereabouts) into Java-related development and porting the language to every computer system it sells.

Alliances between Sun and just about anyone who has the vaguest reason to dislike Microsoft are the order of the day. And to top it all off, SunSoft, (the division of Sun that owns Java) has just effectively pulled the rug out from under Microsoft by making the specifications for the Java Virtual Machine (the platform-specific run-time for Java) incompatible with Microsoft's current implementation.

The message to Bill is that this is a market he can't own, and a lot of companies will go out of their way to ensure he never gets a chance.

Chapter 3: He who lives by the sword

Is this a good thing? Is it in our interests to see Microsoft lose control? I would argue that to the degree Microsoft's plans have been thwarted so far, it is very good for the market and, strangely, very good for Microsoft.

Losing control of certain aspects of the market, most notably standards, will sharpen Microsoft's competitive instincts — it will make the company try harder. This is good because challenging Microsoft has been such a daunting prospect that most vendor offensive forays have had little impact.

For the market, Java is a new stimulus and is perhaps the first truly generalized, multivendor, cross-platform technology we've ever had.

This technology provides a new way of thinking about computers and the markets they serve and creates new niches that will enrich end-user choices and drive prices down.

This promises to be a story that will rival *War and Peace* for length and complexity. Java will force major changes in computer and network technology and architectures over the course of this year and, for a change, the real winners will be IT groups.

Java: Soul of the new IT or spawn of the devil? Learned philosophical treatises to nwcolumn@gibbs.com or lecture me at (800) 622-1108, Ext. 504.

'Net Buzz

The latest on the Internet/intranet industry

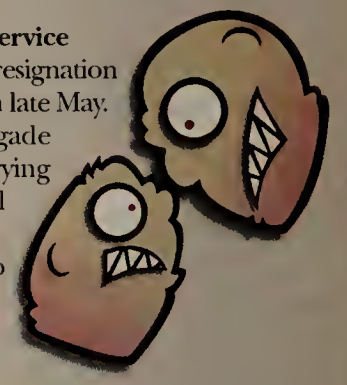
By Chris Nerney

AN ALLIANCE GONE AWRY A few weeks ago, we got in some digs regarding what we perceived to be a lack of fervent, widespread support for the **Internet Society's (ISOC)** plan to expand the number of top-level Internet domains and registries.

Nonetheless, we truly do believe ISOC deserves credit for assembling a wide-ranging coalition of organizations to sign on to the proposal. This is no small feat, for cyberspace alliances can be difficult and fleeting.

Just ask **Karl Denninger** and **Eugene Kashpureff,** the two most persistent and vocal critics of the existing **Domain Name System (DNS).** In March, the pair joined forces to announce a rival scheme called the **Enhanced Domain Name Service (eDNS).**

Now, only three months later, their alliance has devolved into a fusillade of bitterness, acrimony and finger-pointing — just the kind of thing 'Net Buzz loves to report.



Denninger, who runs a Chicago-area **Internet service provider,** launched the first public salvo, posting his resignation as president of eDNS to the NewDom mailing list in late May. He also accused Kashpureff — who runs the renegade **Alter.NIC** registry out of Bremerton, Wash. — of trying to destroy the alliance by removing eDNS top-level domains from Alter.NIC's root servers. He then called Kashpureff nothing more than "a pirate who will extort money or favors from people."

Bill Gates, are you hiring?

Kashpureff responded by demanding that Denninger return an Alter.NIC CPU in his possession, vowing to refer the matter to "the proper authorities" in Chicago.

The dialogue then degenerated into a volley of "did nots" and "did sos." All of which makes ISOC and its allies look (choose one or more): a) reasonable, b) responsible, or c) adult.

ALL EYES ON INTERVU Web site operators who offer video content to customers constantly face what could be called The Format Dilemma — trying to decide which format will work for the most customers.

Now a San Diego-based video services company says it has a new feature that allows any user to watch any video on your site, no matter what kind of video player resides on their computer.

InterVU, Inc. provides a turnkey service that encodes and hosts customer videos on its network for access by end users through the customer's Web site. The company targets entertainment companies and advertisers, and counts among its clients **Major League Baseball, Court TV** and **Turner Broadcasting.**

InterVU today will announce integration of an "All Eyes" feature into its network. All Eyes identifies each PC's player software and downloads a compatible video format, whether it's MPEG, AVI, Vivo or QuickTime.

Doug Augustine, vice president of marketing, says InterVU eliminates the need for customers to pay for video servers, client/server software or maintenance. The service is priced on a usage basis, so Web site operators pay only for video that's viewed from their pages. Examples of InterVU's services can be found at www.intervu.net.

Of course, InterVU can't help if no one *wants* to view your video. That's where production values and an "A-list" director come in.

CROSSING THE PLATFORM DIVIDE Broadening its reach beyond Unix, Cambridge, Mass.-based **VirtuFlex Software Corp.** has unveiled a Web applications platform that works with Windows 95 and NT.

The start-up's VirtuFlex 2.0 is designed to generate dynamic Web pages from HTML templates containing embedded macro tags. Features include Web form processing, SQL database integration, validity and security checking as well as e-mail and fax capabilities.

The Windows version will be available June 15 for $495. The Unix version will cost $2,495.

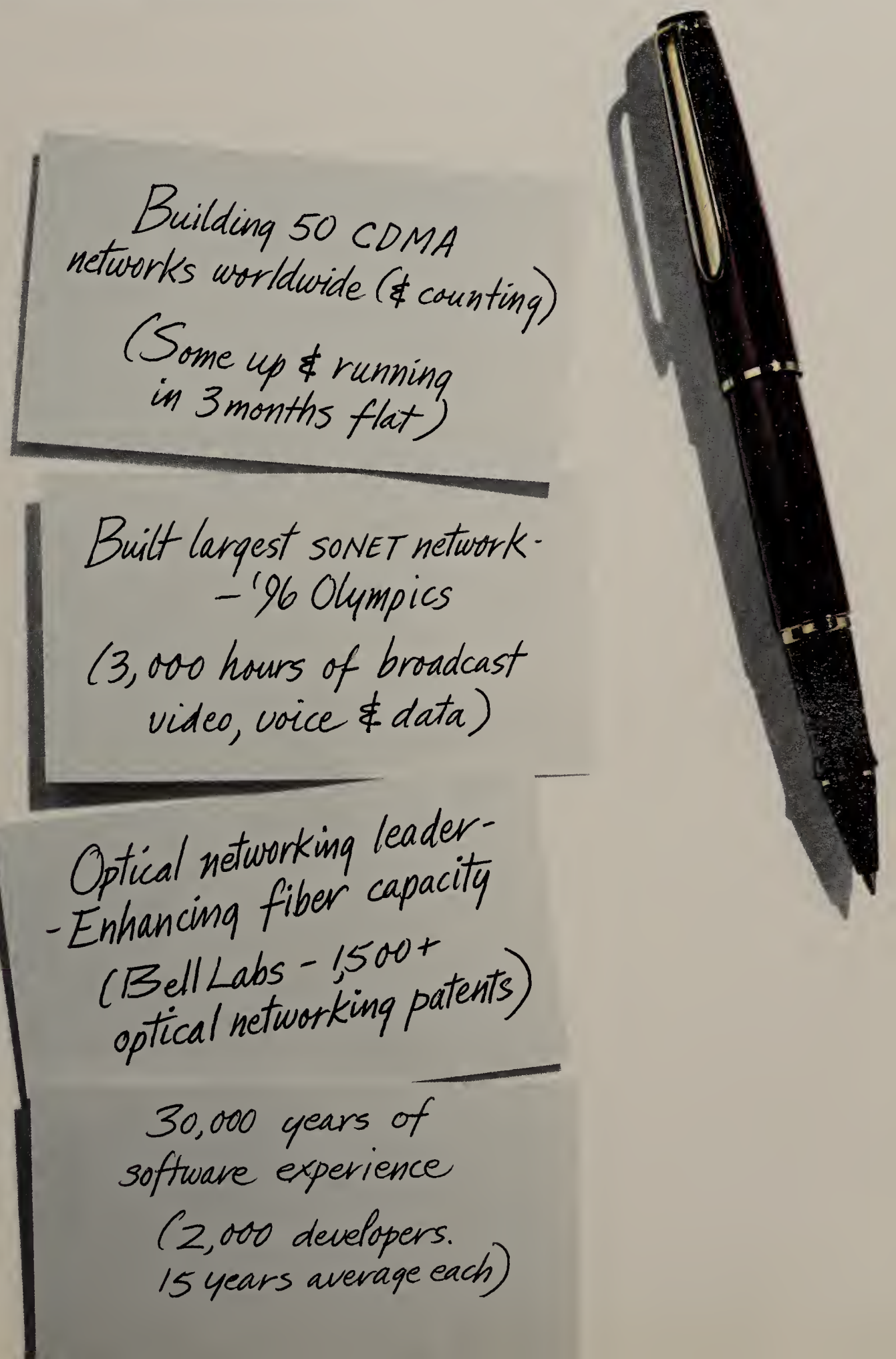
'Net Buzz almost starred in a video once. Actually, we had a walk-on part that ended up on the cutting room floor. But if you send us your best Internet and intranet news, we'll do all we can to make you a star, if only to grab onto your coattails at a later date. Contact Chris Nerney at cnerney@nww.com or (508) 820-7451.

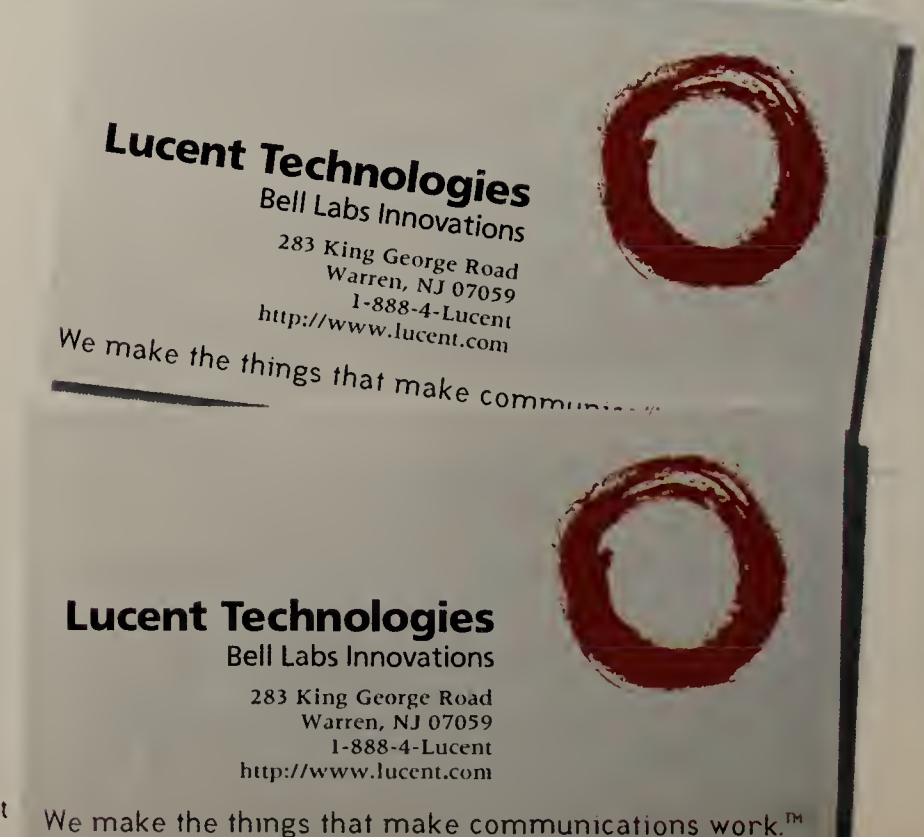
"Everyone tells me

they know their way around

networks.

What makes you any different?"





We know networks.
Every twist.
Every turn.™